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University Press Club of the University of Montana

ENGINEERS' EDITION

Montana Plans for Montana Engineers.

THE WEEKLY KAIMIN

"The University of Montana, It Must Prosper."

VOL. VII. UNIVERSITY OF MONTANA, MISSOULA, APRIL 25, 1912. NO. 13

EARLY HISTORY BY FIRST INSTRUCTOR

Beginning of Engineering Department Sixteen Years Ago Is Recalled by Professor Frederick C. Scheuch--- School Then Combined With Modern Languages.

When Dr. Oscar J. Craig arrived in Montana in July, 1895, to assume his office as pioneer President of the University, he found that no provision for an Engineering Department had been made by the Board of Education. President Craig was deeply interested in having Engineering courses given in the University as he had for years been connected with an Engineering school. So, at his suggestion, the Board of Education granted him permission to lay the foundation for our present School of Engineering.

Since the funds would not warrant the election of more than four members for the entire faculty of the University, it is obvious that each member of the faculty had to take charge of work in more than one department.

In this manner the Engineering work was added to that of the Department of Modern Languages. As far removed as these two subjects, Modern Languages and Engineering seem to be, it is amusing to recall with what enthusiasm these two were blended and how well they seemed to articulate.

FREDERICK C. SCHEUCH.
First instructor in Engineering.

When on September 11th, 1895, the University opened, the first instruction in Engineering work was offered to young men in the state. The Department of Engineering was then designated "The Department of Applied Science," in contrast to that of Natural Science, which comprised the departments which have been authorized since, of Chemistry, Geology, Biology, and Physic.

Admission to the first college year in Engineering was allowed upon passing the following required subjects: Geometry, Trigonometry, and Higher Algebra, some few courses in Rhetoric and Literature; Ancient and Mediaeval History, and Drawing. Several exceptions to the above requirements were allowed. The majority of those taking the work were enrolled in the Preparatory School, students were allowed entrance upon reaching their thirteenth year, and being well grounded in the elements of an English education.

The catalogue of that first year gives the following statement: "The Department of Applied Science has for its object the giving of a good general education making a specialty of those technical branches belonging to Engineering." About all that we were able to undertake was a fair amount of instruction in Carpentry work and some work in iron, with a three years' course in Model, Free-hand, and Mechanical Drawing. During the Preparatory years free-hand drawing was given, including drawing from copy, perspective drawing from objects, and from parts of machinery. Drawings for use in pattern making were required in the Junior year, lettering, symbolic hatching and tinting received a fair amount of attention.

Shop work consisted of the work generally given during the first year, such as sawing, planing, etc.; in fact, all the operations in carpentry work. As the funds of the University were such that lathes could not be purchased, arrangements were made with a foundry in the city where the boys might obtain some such work. Once every week the class would assemble and walk across the railroad bridge to the foundry, often, all we obtained out of it was the walk, as the foundry might be closed, and the proprietor taking a vacation of uncertain duration. If we succeeded in breaking into the foundry, we had to be satisfied with a foot power lathe, at which one student worked while the remainder of the class stood about, criticized and offered suggestions. One can well imagine that under such conditions every piece "turned out" was a composite, showing the good as well as the bad work of each member. Yet, it was surprising with what eagerness and zeal those men worked under such hardships, men who have since graduated from the institution and who have made good in their profession. It is not necessary to state that work in iron was narrowed down to filing, chiselling, key fitting, and similar exercises.

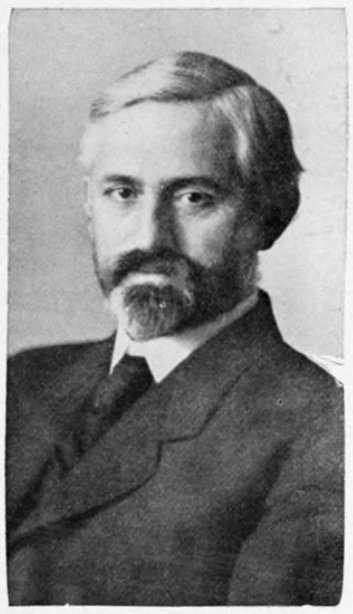
Shop courses were planned on a rather large scale, but unfortunately funds would not permit the establishment of a foundry or forge shop until several years later. The work in pattern making drawing was rather complete and some simple patterns were made in the shops, but not until the University moved to its present location could more advanced work be given.

The shop equipment during the first years of the University consisted of eight benches, accommodating sixteen students. (The last one of these original benches is still used in the basement of Science Hall.) Each bench was supplied with the following equipment: One 6-inch square, mitre and try combined; one 8-inch sliding bevel; two 8-inch marking guages; one scriber; firmer chisels (8 in set); guages (4 in set); one 22-inch cross-cutting saw; one 24-inch ripping saw; one 8-inch drawing knife; three planes, fore, jack and smooth; one set auger bits and

(Continued on Page Four.)

FROM DR. DUNIWAY

The School of Engineering in the University of Montana exists to serve the people of the state by supplying them with technically trained men for industrial development. The same principal holds true in this professional school which justifies public support of any professional education. The organization of society and industry is such that the public money is wisely expended to train technical leaders. The great industrial development of modern Germany is based upon scientific attainments of her physicists, chemists, engineers, etc., trained at public expense in their great universities and schools. It is not enough that young men of Montana with taste in that direction should become good mechanics; others must be qualified by



DR. C. A. DUNIWAY.

the best technical training to be the engineers to orginate, execute, and administer industrial enterprises in mining, irrigation, transportation, and manufacturing. The State University Engineering School needs buildings; needs additional equipment; needs a larger faculty, in order to keep its work to the best standard. The faculty of the School of Engineering appreciate their opportunity to carry the more elementary technical instruction to men in railroad shops, in smelters, and in other technical lines, yet the chief work of this School of Engineering must continue to be a production of the higher types of leading engineers.

C. A. DUNIWAY, President.

GROWTH RAPID IN PAST THREE YEARS

Fifteen New Courses Have Been Added to Curriculum and Faculty Greatly Increased---Much Equipment Is Donated By Public Spirited Men.

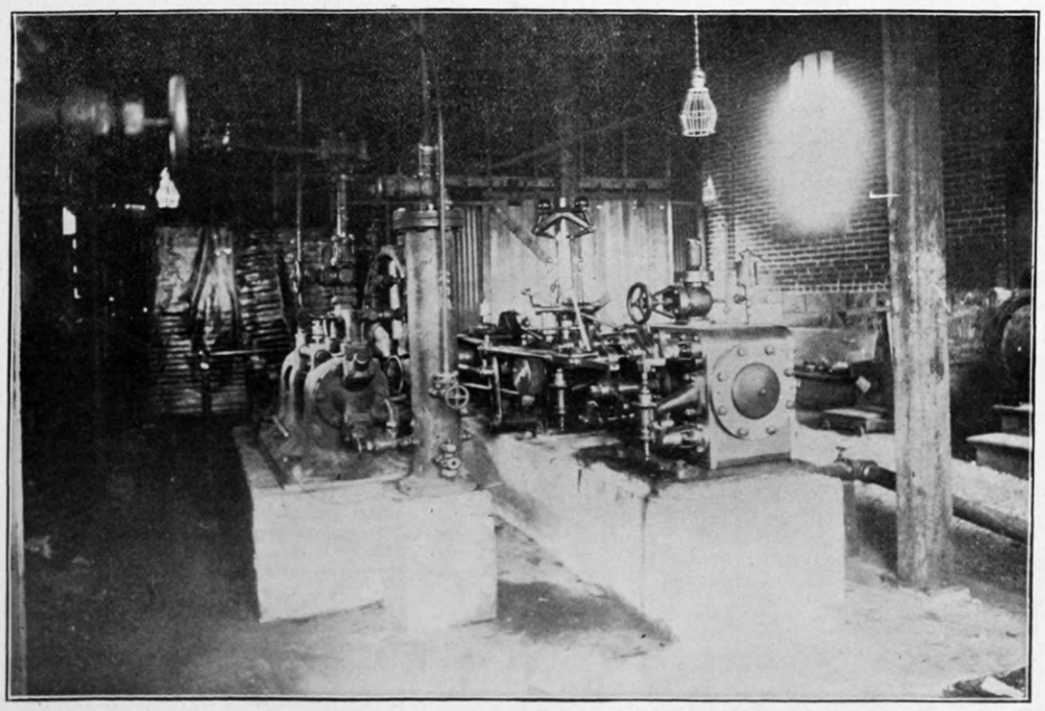
The growth of the College of Engineering within the past two or three years has been very marked. The faculty members have been increased in number by one hundred and fifty per cent. By careful selection the engineering faculty has had very proficient men added to its numbers. The courses have been strengthened and added to; about fifteen new courses having been added to the list. In order to keep pace with this development, the equipment has been strengthened very materially. We might here briefly note the recent installation of a Corliss engine and refrigerating machine, a cement testing machine, four gasoline engines, four generators, two motors and an exciter, a photometer, complete fuel testing apparatus, including calorimeters and gas analysis apparatus, a milling machine, a steam condenser, transits and levels, a machine for testing paving brick, additional indicators, and a number of electrical and other instruments. When calling to mind this increased equipment we must not forget the generous donations of equipment which have been made during the past two years. These recent donations have a value of about six thousand dollars and we, the students of the College of Engineering, take this opportunity to thank those who have made the donations, and also Professor Richter and others who have obtained them. The local men who have donated machinery to us are Mr. F. S. Lusk and Mr. W. R. Glasscock. Other donations have been made by eastern manufacturing firms which fact demonstrates the opinion which they hold of the College of Eengineering of the University of Montana. The Missoula Light & Water Company also donated the use of their work car and the time of an operator. With this increase in faculty and equipment, the Engineering Department of the University now offers a course of study as broad and extensive as that of many eastern universities.

When speaking of the growth of this department we must not fail to call attention to the extension work of the College of Engineering. These engineering extension courses have been inaugurated along the line of the Northern Pacific railroad, and it is with pleasure that we note the great success with which these courses have met. It is the intention to extend this work to every corner of the State of Montana. Extension classes have been organized at Livingston, Helena and Missoula. It should also be noted that the engineering faculty gave freely of their evenings up to a late hour. It has been a surprise as well as an inspiration to the engineering students to note the enthusiasm with which the extension classes have carried on the work given them. As so much has been accomplished in so short a time, we cannot but call attention to the great value that this work has to the state at large. The above growth is evidence of the fact that the University of Montana belongs to the people of Montana and that the further development of her engineering department is a vital factor in the development of the natural resources of the state.

A. W. RICHTER.
Head Engineering Department.

It is evident that our facilities must continue to grow if we are to continue to keep pace with the development of the state. The immense coal fields, the unharnessed water powers, the development of the mining industries, the introduction of manufacturing plants, and the establishment of new and the development of old cities will call for the services of the trained engineer.

As the resources of the state are utilized and developed we look forward to the continued growth and prosperity of our College. As we look ahead, we see more and more additions to the members of our faculty and to the equipment. And we hope soon to see our new engineering building offering new facilities and relieving our present cramped quarters.



A VIEW IN THE STEAM LABORATORY.
Corliss Engine and Refrigerating Plant.

ENGLISH — AN ENGINEER'S IMPORTANT TOOL.

"Language is not an inheritance but an acquisition; it must be acquired by continuous and incessant effort. There is no tool used by the human mind requiring more polishing and taking a finer finish.

The engineering student should have sufficient acquaintance with the best masterpieces in English to give him a taste for the highest type of English prose, and enough practice in writing themes to secure for himself a clear and expressive style of composition. An important feature of a modern engineer's duties is to make reports on various phases of engineering undertaking. These reports are an index of the man, and if they are defective in form or finish, the natural conclusion is that he is also deficient as an engineer."

DEPARTMENT FACULTY HAS SOME STRONG MEMBERS

COMPOSED OF FIVE MEN WHO ARE EXPERTS IN THEIR RESPECTIVE LINES.

Professor Richter, head of the Engineering department, is a graduate of the University of Wisconsin, taking the degree of B. M. E. Two years later he took the master's degree from the same institution. Professor Richter is also a graduate of Cornell University, with the degree of M. M. E. In his collegiate work as professor, Mr. Richter was successively instructor in Engineering, Assistant Professor of Steam Engineering, and Professor of Experimental Engineering at the University of Wisconsin. In September, 1909, Professor Richter came to Montana to take charge of the School of Engineering at this University, which position he now holds. Professor Richter is a man of wide practical experience, having spent five years in the employ of shops and manufacturing plants. While at Wisconsin Professor Richter also had a large consulting practice throughout the state. In this capacity he designed electric, steam and gas power plants. He is often called upon to test and investigate old plants, with a view to determining and improving the cost of operation or decreasing the waste of energy. As an expert engineer, he was also called upon to act as expert witness and as judge and arbitrator in determining important cases. During the last year of his residence at Madison he was consulting engineer for the State Board of Control.

Professor Richter is a member of the honorary scientific societies of Sigma Xi and Tau Beta Pi; he is also a member of the American Society of Mechanical Engineers, The American Gas Institute, and the Society for the Promotion of Engineering Education.

Professor Richter is one of those men who believe in thorough co-operation and sympathy between instructor and student. Hence, he has adopted the policy of entertaining numbers of the engineers at dinner at his home, and he has always been willing to throw open his house on University avenue to any social affair the engineers may wish to give. As a result he has kept in constant touch with the spirit and feelings of his student body; and they, on the other hand, have had the advantage of personal contact with the head of their department, which students in larger universities seldom enjoy. Professor Richter is exceptionally popular among the engineering students, all of whom are truly loyal to their college and their Alma Mater.

WILLIAM R. PLEW.
Assistant Professor of Civil Engineering.

In civil engineering, too, the students of the engineering college receive instruction from a professor who is exceptionally well fitted to instruct, both from the standpoint of college training and that of practical experience. William R. Plew, M. S., in Civil Engineering, is a graduate of the Rose Polytechnic Institute, from which in 1907, he obtained his bachelor's degree, and in 1910, his M. S. degree. From 1907 to 1910 he was instructor in Civil Engineering in that school, and he was also Assistant City Engineer of the city of Terre Haute, Ind., and in 1909, designing engineer for the Paris Bridge company of Paris, Ill. Professor Plew is a member of the American Society of Civil Engineers.

PHILIP S. BIEGLER.
Assistant Professor of Electrical Engineering.

Professor Biegler is a graduate of the University of Wisconsin, taking the degree of B. S. in Electrical Engineering in 1905. Previous to his graduation, he spent two years in the operating and testing departments of the Chicago Edison company, on electrical design of the Fisk street station, which station is the pioneer of the large steam turbine stations of the country. The following three years Professor Biegler was instructor and then assistant professor of Electrical Engineering at the University of Iowa. In 1909-10 he was assistant to the electrical engineer of the Washington Power company at Spokane, Wash., and while there was in active charge of the electrical design of the Little Falls hydrostatic plant. The following year he was assistant professor of electrical engineering at Purdue University. During the summer vacations Professor Biegler was employed by the Western Electric company, Chicago Telephone company and D. C. Jackson.

Professor Biegler is a member of the honorary scientific societies of Tau Beta Pi and Sigma Xi. He is also a member of the American Institute of Electrical Engineers and the Society for the Promotion of Engineering Education.

GEORGE H. CUNNINGHAM.
Mechanical Engineering.

In Professor George H. Cunningham, B. S., M. E., instructor in Mechanical Engineering, the students have a man who combines with the best of college training, the best of practical experience in Engineering. He obtained his degree of Bachelor of Sciences at the Virginia Polytechnic Institute in 1906, and his M. E. degree at Cornell in 1908. During the year 1906-07 he was Instructor in Graphics at the Virginia Polytechnic Institute, and after receiving the degree of M. E. at Cornell, he took a position in the engineering department of the Tennessee Coal, Iron & Railway company at Ensley, Ala., where he was engaged on stock mill and blast furnace construction. In the following year he was with the engineering corps of the Virginia Bridge and Iron company of Roanoke, Va., and last year he was Assistant Superintendent of the power and mechanical department of the Consolidation Coal company at Jenkins, Ky.

Professor Kennedy is also a member of the American Society of Mechanical Engineers.

G. A. GROSS.
Instructor in Engineering Shops.

As instructor in shop practice the engineering college has a practical man who knows machinery in all its details. G. A. Gross is the man. He finished Lake Mills High School in 1900, and from 1904 to 1908 was assistant foreman for the Fargo Creamery Supply company. During the three years following, he was mechanician at the College of Engineering of the University of Wisconsin, which position he left to accept the position of instructor in shop practice in the College of Engineering in the University of Montana.

Among the other professors teaching Engineering students are: Professor F. C. Scheuch, French and German; Professor G. F. Reynolds, English; Professor G. M. Palmer, English; Dean Mary Stewart, English; Professor L. C. Plant, Mathematics; Professor E. F. A. Carey, Mathematics; Professor J. P. Rowe, Geology; Professor M. J. E'rod, Bacteriology; Professor W. D. Harkins, Chemistry; Professor J. W. Hill, Chemistry; Professor R. N. Thompson, Physics; Professor J. H. Underwood, Economics.

GIRL'S IDEA OF MEN.

A little girl wrote this composition on men: "Men are what women marry. They drink and smoke and swear, but don't go to church. Perhaps if they wore bonnets they would. They are more logical than women and also more zoological. Both men and women sprung from monkeys, but the women sprung further than the men."

PROFESSOR W. R. PLEW
Civil Engineering.

THROUGH THE TRANSIT INTO THE MYSTIC FUTURE

MAY THE FIVE GRADUATING ENGINEERS REALIZE THEIR HIGHEST AMBITIONS

In speaking of the alumni who "are," we must not forget those who are "soon to be," our present Seniors. We offer them our sincerest toasts and good wishes, as they go forth to join in the surging mass of workers. May these five, as the three wise men of old, follow after the high star of their ambitions, until Fame ranks them with the greatest of their profession. And may they ever, despite the glory of personal success, give fealty to whom all fealty is due, their Alma Mater.

Three years ago this last September, there gathered at the University a score of whom Wisdom directed to the portals of the College of Engineering. Bravely, yet with diminishing numbers, did they battle with legions of Freshmen, Sophomore, and Junior studies, until last fall but five remained. But they were Seniors. Realizing fully the dignity of their position, they have sturdily overwhelmed all obstacles in their path, and stand again at the portals. They will pass out, the doors will close, and never again will they return as mere students.

They stand at the threshhold of the world of business, looking in upon the great battle of life; they will enter, fully equipped in every way to take their part in the daily strife. For their's has been no narrow training during the past four years; studies have not alone filled their days. Three of the four class presidencies have been their share; society has seen them often. Football, baseball, and track have all required their services. Literary ventures, too, have found these Engineers useful as editors and managers alike. In music and in the drama as well, they have had their share of experience, and so, fully equipped, they go forth. They enter the portals of the business world; they look longingly back on their University days, then turn and set their steps resolutely toward the future; a cloud obscures them, and we see them no longer. But though we see them not, our hearts go with them, and so we'll wish them all fortune and happiness and the best this world can give.

* * * * * *

Three years roll on, and slowly the cloud lifts. We see in the distance, slowly climbing the last steep slope, a sturdily built young man, picturesquely clad in a blue flannel shirt, khakis and high tan boots. Reaching the top of the slope he stops and wipes his glasses, then pushes forward to the edge of Rim-Rock, and pauses to view a scene which few have beheld, a scene of unparalleled beauty. Two thousand feet below him, at the base of those sheer cliffs on which he stands, there stretches out before his eyes a vast plain, eight miles across and fifteen miles in length. To the south the mountains and vast snow fields, to the north he sees the canyon through which the river wends its way, and with his glasses he even discerns the headgates o the Teton Irrigation Project. This all he sees in a glance, then turns his eyes to the beauties which nature has so lavishly spread before him. On the farther side of the basin a slender chain of blue betokens the river, and from this rises a ridge of wooded hills. Beyond these the Goat Peaks rear their jagged snow-capped peaks ten thousand feet or so above the sea; and in their midst, the monarch of them all, towers old Mt. Ranier. Full seven thousand feet it shrowds above them all, snow-coated, wreathed in clouds, save when the wind and sun unite to show the glorious wonders of its threefold summit. Well is it called "Tahoma," the "Mountain that was God." With a sigh the engineer turns from the vast beauties unfolded before him. He raises a huge rock, the like of which an ordinary man could hardly move, and hurls it over the cliff. It dashes to the depths below with sharp reverberations, breaking the spell of enchantment. The man returns to his study of the basin below him. "Here the railroad will enter; there I will span the river; and over yonder I will build a city." Not for naught had he specialized in bridge construction and municipal engineering.

Three months passed by, and a second man, slight and dark, stood at the edge of Rim-Rock. He, too, saw the beauties of the scene and poured forth his thoughts in song. Then focusing his spyglass on the basin below, he saw the city "Thieme," named for its founder. He saw its need of lights, and, full of enthusiasm, hastened back to the metropolis; not for naught had he learned the wonderful powers of speech while selling aluminum. He interested capital, organized the Baker Electric Company, and gave to the city "Thieme" electric illumination. Fuel, however was high.

There then appeared upon the scene another of the five, he of the football shoulders, Dan Connors. He realized the high cost of electricity. Far above the city he came upon the great fall of the Teton. What better than to harness this water power instead of using steam? There was but one drawback—he knew of no turbine which would fulfil his requirements. Many telegrams went back and forth from the city of "Thieme" to the outside world, until finally one day the railroad brought in two huge turbines of a new type, the Ernest W. Fredell type. Work progressed rapidly, until finally better and cheaper lights were furnished by the Baker and Conners Electric Company.

It remained now for the fifth alone of the little band to add his touch to the work. A man arrived one day and quietly bought up a section of land. A month later the news was spread that work on the Mason Coal Mine would begin the following day. Not only was the mine established, but the Mason Gas Company was organized, and "Thieme" became one of the most up-to-date towns in the Northwest.

* * * * * *

The cloud drifts down, blotting out the future, and we live again in the present. Yet thus, we hope, will these five college chums realize their high ambitions, and make themselves useful in the great world before them.

THE ENGINEER AS AN ARTIST AND SCIENTIST.

When the French Commissioner, sent to the Centennial Exhibition at Washington, reported to his home government, he pronounced the work of George H. Corliss as "the greatest work of art the world has produced." The beauty of his design was considered superb and impopsing in the extreme. His engine was certainly capable of inspiring those who beheld it. How wonderfully has the art flourished since 1876. The beauty of design and of power has increased one hundred fold.

How inspiring is the work of a Watt, a Stephenson, an Edison, a Steinmetz. Had engineers of this stamp not lived what would the world be today; how backward and crude our civilization; how narrow our line of thought. Ponder a moment and think what the condition of this little world of ours would be if the Engineer had no part in it. Turn where you will and you will find his handiwork. The things you do, the things yo ueat, aye, the things you see, owe allegiance to him and his creative genius. John Ericcsson turned the destiny of the greatest nation on earth and increased the happiness of its people. By a masterstroke, George H. Corliss revolutionized the cotton industry. Thomas A. Edison, George Westinghouse and others like them have revolutionized our very lives. In truth the Engineer is an artist, a scientist having in mind the one great ideal: Improvement in the conservation of the resources of our country, making life better and more worth the living and conserving the resources for future generations.

What higher ideals can a young man look for in choosing his profession for life; what nobler work can he do than to give his best thoughts and energy to the bettering of life's conditions for both the present and future generations?

A GOOD ARTICLE.

The Practical Engineer of April 9, 1912, contains an interesting article on "Increasing Ice Capacity." The increased capacity is obtained by the addition of an absorption system to a compression plant without extra boilers or buildings.

THE ENGINEERS' CLUB.

The Engineer's Club held a meeting on Wednesday at 11:30 a. m. and elected officers for the coming semester.

SUMMER SCHOOL TO HAVE SOME PROMINENT TEACHERS

PROFESSOR REYNOLDS DIRECTOR OF SUMMER SCHOOL—SIXTY COURSES OFFERED.

The summer school to begin in the University on the 10th of June this year promises to be a successful session. There has been engaged for the summer work many professors from other institutions and all of the people coming to act in the capacity of instructors are the best which could be procured.

For several years past the University has endeavored to get an appropriation for a summer school, but for a long time has not been successful. This year, however, enough money was released to make a summer school possible and all of the University authorities have spared no effort to make the summer session a success.

Professor George F. Reynolds has been made director of the summer school and under his management will be placed most of the work given. We, of the University, know Professor Reynolds and think the move a good one.

The complete announcements of the school are now out and may be had upon application to J. B. Speer, registrar of the University. In the list of professors to instruct in the summer school we see many new names, or rather, the names of many professors from other institutions. The school will have a faculty of 23, one-third of which are from other colleges.

The new professors will be John S. McIntosh, Ph. D., from the University of Upper Iowa, in charge of Latin; Herbert G. Childs, Ph. D., Columbia, in charge of Education; William G. Bateman, A. M., Stanford, in charge of Chemistry; Stephen F. Ball, Portland Public Schools, Instructor in Intermediate Education; Nettie A. Sawyer, Seattle Public Schools, in charge of Primary Education; Mildred Clark, Missoula Public Schools, Instructor of Public School Music, and Margery Bell, Chicago Playground Association, Instructor in Supervised Play.

The summer school will be run just as is the regular session of the institution. The library will be open at the regular hours all summer.

Craig hall will be open and here the women may obtain room and board for $25 per month. The men can get suitable rooms near the campus and board will be furnished in Craig hall for $4.25 per week.

All in all, the summer school at the University of Montana affords a wonderful opportunity for all of the teachers and scholars of the state. Everything, including amusements, can be obtained in Missoula and one coming here may mingle pleasure with work.

The summer session will close on July 20.

SORORITY BALL MOST BRILLIANT OF SEASON

Formal Function Given at Elks' Club by Kappa Alpha Theta — Many Guests Are Present.

One of the most brilliant events of the social season at the University was the formal ball given by Kappa Alpha Theta sorority at the new Elks' club building last Friday night. It was an inter-fraternity affair, the first of its kind to be given at the University. The members of all the fraternities on the campus were given invitations to the function.

The floor was great, the punch was greater, and the music was greatest, and the large number of guests present enjoyed every minute of the time. The moonlight dance and the firefly dance were very clever ideas and received the sincere admiration of the guests. Those who stood in the receiving line were:

Mesdames E. L. Bonner, Hiram Knowles, E. W. Spottswood, J. P. Rowe, A. W. Wilcox, J. J. Lucy, J. H. Bonner, H. H. Slaughter, J. G. Reinhard; the Misses Lucile Marshall, Eloise Knowles, Mildred Clark, Anabel Robertson, Gertrude Whipple, Louise Smith, Hazel Lyman, Gladys Freeze, Grace Saner, Alice Hardenburgh, Katherine White, Bess Rhoades, Esther Birely, Frances Page, Merle Kettlewell and Marguerite Bonner.

MONTANA DEBATERS WIN GREAT VICTORY OVER PULLMANITES

INTER-CLASS TRACK IS SLATED FOR SATURDAY

Class Track Teams Will Contest for Trophy Saturday Afternoon.—Winners to Go Against Bozeman.

This week has seen a great increase in interest in the interclass meet, which will be held on Montana field Saturday afternoon. With all entries considered, however, it looks as though a "4" will again this year be engraved on the president's trophy. They are strong in every event and they seem to have five firsts clinched with a show for some seconds and thirds. Who will follow second is a hard question that Saturday afternoon alone can answer.

Up to the time of going to press, the various entries were as follows:

100-yard dash—Stone, '13; Owsley, '15; Day, '14; Sheedy, '14; Vealy, '14; Ronan, '14; Dornblaser, '14; Plummer, '14.

220-yard dash—Stone, '13; Owsley, '15; Day, '14; Klebe, '14; Sheedy, '14; Cameron, '13; Vealy, '14; Weidman, '13; Ronan, '14; Kelly, '14; Dornblaser, '14.

440-yard dash—Klebe, '14; Haines, '14; Cameron, '13; Weidman, '13; Vealy, '14; Kelly, 14; Dornblaser, '14.

880-yard run—Baxter, '15; Kuphal, '14; Klebe, '14; Haines, '14; Cameron, '13; Weidman, '13; Dornblaser, '14; Maddox, '15.

One-mile run—Taylor, '15; Kuphal, '14; Klebe, '14; Cunningham, '14; Haines, '14; Cameron, '13; Dornblaser, '14; Rask, '15; Maddox, '15.

Two-mile run—Taylor, '15; Gervais, '13; Kuphal, '14; Klebe, '14; Cunningham, '14; Haines, '14; Cameron, '13; Hansen, '13; Dornblaser, '14; Maddox, '15.

120-yard hurdles—Klebe, '14; Vealy, '14; Ronan, '14; Dornblaser, '14; Plummer, '14.

220-yard hurdles—Owsley, '15; Klebe, '14; Sheedy, '14; Ronan, '14; Vealy, '14; Dornblaser, '14.

Shot put—Owsley, '15; Klebe, '14; Miller, '12; Vealy, '14; Dornblaser, '14; Plummer, '14; Spencer, '15.

Hammer throw—Stone, '13; Day, '14; Klebe, '14; Fredell, '12; Miller, '12; Dornblaser, '14; Plummer, '14.

Discus—Owsley, '15; Day, '14; Klebe, '14; Fredell, '12; Miller, '12; Dornblaser, '14; Plummer, '14.

Pole vault—Sheedy, '14; Klebe, '14; Fredell, '12; Miller, '12; Vealy, '14; Ronan, '14; Dornblaser, '14; Plummer, '14.

High jump—Whisler, '14; Owsley, '15; Day, '14; Klebe, '14; Fredell, '12; Cunningham, '14; Vealy, '14; Weidman, '13; Dornblaser, '14; Plummer, '14; Sheedy, '14.

Broad jump—Owsley, '15; Sheedy, '14; Day, '14; Klebe, '14; Haines, '14; Vealy, '14; Ronan, '14; Weidman, '13; Dornblaser, '14.

NINTH ANNUAL DEBATE GOES TO UNIVERSITY BY UNANIMOUS DECISION.

DEFEATED ARE GAME

Washington Men Are Great Losers, Say Varsity Men—Clash on Issues Not Very Brisk.

One of the most pleasing victories the University has won in years was the victory in the Ninth Annual Debate with Washington State College, which took place in Pullman Friday evening. The superiority of the Montana team, Messrs. Sewell and Miller, was unquestioned, the decision of the judges being unanimous.

A Record.

In winning this debate the University has set a record. Never before was a W. S. C. team defeated by Montana on her own platform; never before was a Montana team a unanimous victor. Much praise is due to those debaters, far more is due to that sterling coach, Professor George Palmer, whose untiring efforts have done much to increase interest in debating at the University, and who has instilled into two teams the fighting spirit which almost invariably wins debates.

The Issue.

Notwithstanding the fact that the Evergreen, Washington State's weekly, made the assertion that several surprises would be given the Montana men, Sewell and Miller were able to attack every point brought forward. In the opinion of the winning team the Pullmanites did not have as strong a case as they might have had, notwithstanding the fact that both men had debated the judicial recall question with other schools this year. The losers laid their whole case upon the recall of administrative offices and upon this issue the debate hinged.

Good Losers.

Messrs. Stewart and Gaines, who defended the judicial recall, were, according to the Montana men, sportsmanlike losers. And this is the keynote of the friendly relations between the two schools, good losing and good winning. Never has Montana cried over a defeat; never has Pullman offered excuses.

The Montana men were royally treated by the Pullman people. They were entertained at a banquet after the debate, and everything was done to make their visit most pleasant.

Admirers Disappointed.

Every train coming into Missoula Sunday was met by a crowd of anxious students, eager to welcome the victorious team. Sewell and Miller, however, in their modesty, slid into town quietly Monday morning; they were busy all morning at the University receiving the congratulations of the students.

GLEE CLUB TO APPEAR AT VARSITY TONIGHT

First Public Performance in Missoula Will Be Given in Assembly Hall This Evening—Good Program.

The Glee club, after traveling far from home in order to perfect itself has at last been induced to give a concert in the city of Missoula. This will indeed be a musical treat. The program is full of artistic numbers and has just enough of the college air to lend it spice. The concert will consist of musical numbers, readings by Miss Mabel Smith of the department of elocution, and solos by Hans Fischer, who is a real artist on the violincello.

Darby liked the glee club, the people of Plains were "just crazy about it," and since then the club has been working faithfully and is in better form than it was at either of the other places. There can be no doubt but that when the club appears before the Missoula audience, it will render a program that will be a credit to itself and to the University.

The concert will be held in Assembly hall tonight at 8:30 o'clock.

This club is our own and it is the duty of every student to be there and hear "our finest" give a program that cannot help but please.

The program will consist of the songs recognized as the best for college glee club work. The quartet has some near features which will be "sprung" tonight for the first time. Hans Fischer will entertain with two solos and Miss Smith, whose ability is too well known to comment upon, will give some brand new readings.

Director J. P. Rowe has been working hard with the club and everyone who has seen it perform is loud in their praise of the club and the arrangement of the program. If the University students or any friends of the University pass up this chance to hear this concert, and also see one of the best glee clubs which the University has ever had, they will surely have cause to regret it.

The following is the program:

Part One.

Alma Mater, Richards, U. of M., '12, Glee Club.

To Sleep, To Sleep, Adams, from "The Foresters," Tennyson, Quartet.

Musette, Offenbach, Mr. Fischer.

America, Johnson, Glee Club.

The Beauty Doctor, Capwell, Miss Smith.

Winter Song, Bullard, Glee Club.

Part Two.

Nancy, Mah Yellow Rose, Buck-Geibel. Glee Club.

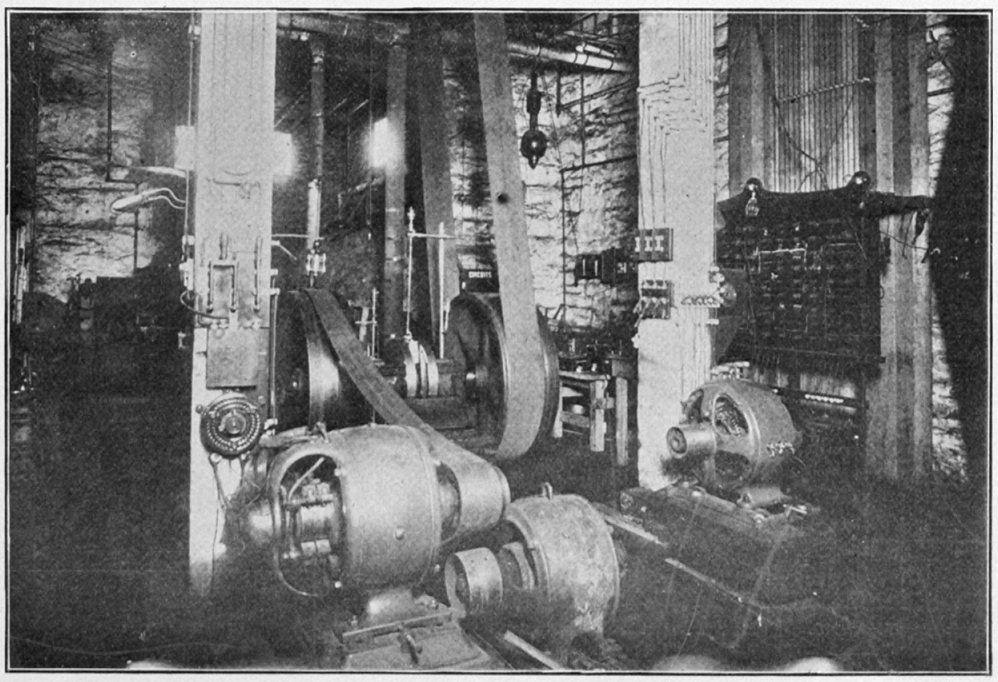
The Ivy Green, Dickens-Russell, Quartet.

Mon Pierre, Almsbury, Miss Smith.

Until the Dawn, Parks, Quartet.

Traumerei, Schumann, Mr. Fischer.

Hail Montana, Ensemble.



A VIEW IN THE ELECTRICAL LABORATORY.

FRATS TO PUT ANIMALS IN THE CARNIVAL PARADE

SORORITIES WILL BE REPRESENTED BY DECORATED BENZINE BURNERS.

That the annual May Day Carnival is going to be a lillipillaz—one yell from marks to tape, there can be little doubt. If any bloke on the campus does not believe the statement that this year's carnival is going to be the best ever, let him talk to Assistant Manager Kelly, he of the Irish parentage. The "cub reporter" felt some trepidation upon being sent to interview Mr. Kelly, who, in the absence of Manager Miller, is the Carnival calliope.

He Is Found.

After a thorough and somewhat timorous search of the Law rooms, the cub, because somewhat tired of his assignment, was seized with a maniacal desire to tell the chief "nothing doing." But a sense of duty forbade this. Soon the Hon. Edward Patrick Kelly was perceived sauntering along toward the Main Hall, his face bespread with the perpetual Irish grin.

Believe Me, Some Carnival.

The Carnival, sure it's on May third, and believe me, pup, we're going to slip one ever this year. We won't say anything about the show this week. But between you and I, it's going to be all to the good. One of the best dancers in Montana is going to put on a stunt; Mutt and Jeff have signed a contract for an engagemnet and, take it from me, our continuous vaudeville is going to cut the flipper. Keep that dope dark, though. Miller and I are going to hand these sleepy studes a jo't that'll pulverize their cocoons.

Big Parade.

The parade is going to be the biggest haw-haw teaser this University has ever focussed a lamp on. Each of the fraternities is going to put an animal in the parade. Any species of animal goes, anything from a laughing hyena to an ichthyosourus. The sororities are going to be represented in the procession—no thank you, this is not a funeral—by decorated benzine burners.

Miller and Clowns.

The whole outfit is to be headed by Managare R. Justin Miller riding in a magnificent equipage drawn by an Arabian steed (?). Miller will be garbed in the most beautiful garments the state of Missouri affords. But, hold on there a minute, pup, I forgot the clowns. Two of the ugliest zooks in school are going to cut the funniest capers their infinitesmal brains can concoct, and that's going some.

Put this down, pup, and run it in your rag: The "Carnival of 1912 is going to be second to not one.".

DIRECT PRIMARY TO BE USED IN NOMINATIONS

Wave of Progressiveness Among Students Effects Another Reform—Amendments Go Through.

That the spirit of progressiveness has permeated the mind of the student body was illustrated Monday evening when the Executive Committee of the A. S. U. M. decided that all candidates for student body offices be nominated by the direct primary system. This new system will bring the student body closer to their affairs than ever before. The new system demands that all candidates be nominated by a petition signed by at least ten students. The primary will be used at the next election, which occurs after the Interscholastic track meet. This primary is the outgrowth of a wave of insurgency which has been on a rampage for over a year, and shows that the Montana student body, although one of the smallest, is one of the most progressive in the west.

Nomiating petitions must be signed by the students. Petitions for all offices must be handed to Gertrude Whipple, the secretary of the A. S. U. M., before next Tuesday.

The Weekly Kaimin

Pronounced "Ki-mean." This is an Indian word taken from the language of the Selish tribe. The word in that tongue means "to write."

Published every week by the University Press Club of the University of Montana.

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THURSDAY, APRIL 25 1912.

CALENDAR.

Tonght—The Glee Club, Assembly Hall.

April 29.—Eighth Number Lecture Course—Adrian M. Newens.

May 3—Big May Day Carnival.

OUR KAIMIN.

The Engineering students hesitated somewhat in undertaking an issue of the Kaimin. We realized that it was no small undertaking. We are not usually given to talking and writing about ourselves; we listen rather to the hum and whir of the shop and machines. However, we are glad to issue forth from behind the benches and lathes and avail ourselves of the opportunity offered us to get out an engineering issue of the Kaimin. We are pleased to have an opportunity of placing before our fellow students and friends in general a little resume of the history and growth of our College of Engineering and of giving them a glimpse of the needs, the hopes, aspirations and ideals for the continued future growth of this department. We hope in these pages to tell our readers of our University and our own particular College of Engineering, and we trust the paper will prove of interest to our friends.

EDITOR.

OUR NEW ENGINEERING BUILDING

It is to be hoped that the funds for our new Engineering building will soon become available in order that the work of erection may be started. The College of Engineering has developed rapidly and is prepared to meet the demands which the state should make upon it. Other articles in this issue point out how efficiently the requirements are met and even anticipated before they arise. To meet the ever-increasing demand of the people and to give the best the University is able to give to its students, ample facilities should be provided in the future as in the past. Though much has been accomplished the good work should continue. When it was found necessary to protect the new refrigerating plant, the Engineering faculty and students gave their time and strength, working until the wee small hours of the morning to erect the plant and build a lean-to to protect it from the weather. It is evident, however, that these same men cannot build an Engineering building. The College of Engineering has developed to such an extent that it is greatly cramped for room. Much apparatus has been donated by the manufacturers; this equipment should be more conveniently and properly housed and protected. We, the Engineering students of the University of Montana, sincerely hope that the money may soon become available in order that the construction may proceed as rapidly as possible.

THE ENGINEERS

There was an old lady, and she had a wooden leg,
So she couldn't travel inland easilee;
And she called her sons and said, "The walkin's dreadful, so I beg
That you'll build a decent road or two for me."
She gave 'em books and paper and she set 'em hours of work
(And twenty hours was just their daily ration).
"And I'll make you rich and famous if you never loaf nor shirk,"
Said Mrs. Civilization.
And it's "Hey! Engineer! Engineer!
Just can all recreation
And buck that part
Till you've got it down by heart,"
Says Mrs. Civilization.

They've gone and they've built 'em clear from Mex to Winnipeg,
And they've fought their way through seven Injun wars,
And they've walked most of the going, but the Lady with the Leg
Has come after in the softest parlor cars.
Sometimes they've slept in banks of snow and sometimes in a ditch;
And glad at that to hold a situation—
And she's made 'em fourth-class famous, but she's never made 'em rich—
Old Mrs. Civilization.
But it's "Hey! Engineer! Engineer!
Just hike through all creation!
And don't you stop
Till you've tidied up the shop,"
Says Mrs. Civilization.

By HORATIO WINSLOW.

WELCOME LAWS.

The students in the College of Engineering rejoiced greatly when they learned that the University of Montana would this year add to its colleges that of Law. We are glad in this, our first official appearance in print since the establishment of Law, to extend a very hearty welcome to our colleagues, the Law students. We wish all success to the College of Law and the College of Letters and Science. May each of the colleges of the University of Montana advance in its growth and influence throughout the state. For each we wish the same growth that we wish for our beloved College of Engineering. Here's to the future growth of our Alma Mater: "The University of Montana, it must prosper."

THANKS.

We, the Engineering Students, take this opportunity to thank Editor D. D. Richards and staff of the Weekly Kaimin for this opportunity to publish an Engineering edition of the Kaimin. Mr. Carl Dickey, of the regular Kaimin Staff, kindly offered his assistance in arranging the articles and we wish to express to Mr. Dickey our appreciation of the time and work he gave to this part of our publication.

SENIOR ENGINEERS.

It is with pleasure and some pride that we announce that, as usual, all Senior Engineers have positions for next year. As they go out, our best wishes go with them. May they succeed in their several undertakings and each year return to their Alma Mater for a few days' visit, in order that they may renew old acquaintances and make new ones.

ALMA MATER.

THANKS.

We, the students of the College of Engineering, wish to thank Professor Scheuch for his article telling of the early days of our College of Engineering and for the kindly interest he has always maintained in the department to which, in its early days, he gave so much of his energy.

We regret that it has been necessary for us to withhold some of our articles from this issue on account of lack of space.—Editor.

EARLY HISTORY OF DEPT.

(Continued From Page One.)

brace; one set awls; hammer, mallet, and nail set.

To give an idea of how scantily the department was supplied, the following tools for general use comprised the full equipment: One framing square, one beading plane, one mitre box, one matching plane, one wood plow, one grindstone,—or just the most necessary tools for work in wood.

The shops were situated in the basement of the University building (now Willard school), a space of 24x52 feet. Ten feet in the east end was partitioned off for use in Assaying.

The shops were the general club room for all the male students of the University. It was here that the schedule of football games was discussed; where the boys ate their noonday lunches and planned their pranks; where handball was played on rainy and snowy days, and where the forerunners of the present-day Carnivals took place. Many a a student was exhibited here as the Wildman from Africa, or as some other monstrosity, to be seen upon payment of the usual dime, "the tenth part of a dollar." President Craig was compelled often to leave his office to go down to the "shops" to quell the riot or send some over-enthusiastic or zealous circus performer to his class or outdoors.

The drawing room was in the rear part of the room of Modern Languages, and its equipment consisted of six drawing tables, some of which are still in use.

The Engineering students of those days lived in eternal fear of their lives; below the drawing room was the old boiler, which was used to furnish heat for the building,—it was reported that this boiler might go on a rampage any day and explode. Thanks to "Chick" White, the students' faithful friend, who was janitor, gardener, engineer, and also acted as guide to the Professors who enjoyed fishing and hunting, thanks to him and to Providence, this expected blowing up never happened. But if we were not molested from beneath we certainly were from above. The pipes which carried the water overhead into the Laboratories of Chemistry, Physics and of other Sciences; (one would imagine these Laboratories to have occupied at least four rooms, when in reality all the work in Science was done in two), these pipes on very cold days invariably froze—then suddenly they allowed all their pent-up feelings to overflow, consequently our drawing-room ceiling would drop down on the heads of the embryonic engineers. This periodical deluge only seemed to add zest to their work, for their ardor was never dampened in the least.

In this drawing room the drawings were worked out and made for the present University campus; the trees, walks, and driveways, as they are laid out, were planned in the old first drawing room of the University, a fact in which the Department takes great pride. Many of the book and apparatus cases now found in the various departments were drawn to scale in the same old room and then forwarded to the mills in Bonner for manufacture.

Among those who were enrolled during the first two years and graduated in Engineering are George Westby '01, Harold Blake '02, Guy Sheridan '03. The enrollment for 1905-1906 was sixteen, during the second year fourteen.

In September 1897, James H. Wells was appointed Professor of Mechanical Engineering, the Board having given permission that a School of Engineering be authorized. From that date on, the Department became an independent school in our University. The equipment was enlarged and plans were made for a thorough course in Mechanical Lngineering. Professor Wells was authorized to expend a sufficient amount of money to assure the state a good working School of Engineering. It was he who planned the Science building as it was originally built (with only one story in the rear portion). The attendance grew perceptibly from year to year, the courses given became stronger and more were offered, and the graduating classes became larger. Owing to a breakdown in health Mr. Wells resigned in the summer of 1899 and was succeded by Professor Arthur Westcott, who, through his large practical experience and splendid thoroughness, brought much prestige to the School of Engineering. After two years Mr. Westcott resigned to accept a position with a manufacturing company in Cleveland, Ohio, and was succeeded by Professor Robert Sibley, who introduced into the Department the beginning of an Electrical Department; as his undergraduate work had been in this line. Enthusiasm and fresh college experience helped Mr. Sibley to obtain a wonderful support among the student body. Professor Sibley was followed by the present head of the Engineering School, Professor Richter, whose splendid attainments so ably fit him to carry forward and build up the School of Engineering, the humble beginnings of which have merely been touched upon in this article.

PROF. F. C. SCHEUCH.

DIGEST OF CASES

Tatem, Trustee v. Eglanol Mining Co., Fay, et al. Intervenors and Appt's. per Holloway, J. April 10, 1912.

(See former appeal, 42 Mont. 475) 113 Pac. 296.

Digest of cases.—The holders of a majority of the capital stock of a mining company, which was heavily in debt, formed a pool of their stock, placing it in the hands of Tatem as trustee for the real owners. The owners of the pooled stock agreed to sell a portion of it, and loan the proceeds to the company for the purpose of development. As the money was received it was turned over to Tatem, as trustee, loaned to the company, and demand notes of the company were delivered to Tatem, who now sues the company at least to recover the amount due on the notes.

The company itself did not make any defense, but certain minority stockholders filed a so-called "complaint in intervention," by which they allege an agreement with the purchasers of the pooled stock that no part of the advances to the company should be repaid except from the earnings and proceeds of the mining property, and that they were induced to purchase their stock by such promises and representations. The intervenors thus seek to interpose a defense on behalf of the defendant mining company, as minority stockholders thereof.

I. Estoppel in Pais. Stranger. As the company was not a party to the transaction between Tatem and these purchasers of pooled stock, the represenations made to them cannot have misled it and cannot operate in its favor.

II. Contracts for Benefit of a Third Person. Must be a duty owing to him by promise. If the contract between Tatem and the purchasers of the pooled stock be regarded as one made for the benefit of the mining company, yet it cannot take advantage of the contract. Under Sec. 4970 Montana Rev. Codes, since to come within the meaning and scope of that section as interpreted by this court. (See 25 Mont. 456) there must be some debt or duty which the promisee owes to the third person which the promisor assumes and undertakes to discharge. In other words, the third person must have such a claim on the party negotiating a contract for his benefit that a consideration may be deemed to have passed from him to such party (the promisee) which raises the implication of a promise from the promisor directly to himself. (Ed. In other words, the third person must not be a mere volunteer, but must have some basis in a just claim recognized by the contract. As the third person cannot sue directly on the contract, not being a party thereto, but only on a quasi-contractual or constructive obligation implied by the law on the circumstances of the case.

III. Remedy for Breach of Contract. Recission. The intervenors who purchased pooled stock from plaintiff under an agreement that the money paid should be loaned to the company, to be repaid only from profits or proceeds of the mine, have their election, upon breach of such agreement, by plaintiff in taking notes representing an absolute liability on the part of the company, to rescind the contract, return the stock and recover the money paid for, or recover damages for the breach. They cannot set it up as a defense to notes growing out of a contract to which they were not parties.

(Ed. note. The question whether the complaint in intervention could not be treated as a bill for the specific performance of the contract not to collect the notes from the general assets of the company does not seem to have been brought to the attention of the court.)

What a Great Company Thinks of Montana's Graduates

The following letter speaks for itself. It clearly demonstrates the standing of the graduates of the College of Enginering of the University of Montana with the large eastern manufacturers who employ men from all the leading engineering colleges:

GENERAL ELECTRIC COMPANY,
Principal Office, Schnectady, N. Y. April 5, 1912.

Prof. A. W. Richter, University of Montana, Missoula, Mont.
Dear Professor,—

Last year you supplied us with two men for our Testing Department, and we shall be glad to have your University represented this year. If you can send us a couple of good men we shall be glad to place them. Please let me have their names, with some idea of their records at the University, and their general characteristics, and I shall take the matter up with you more definitely later on.

Yours very truly,
(Signed) A. L. ROHRER,
Electrical Superintendent,
Schnectady Works.

MONTANA ALUMNI FORGING WAY TO FRONT

Many Men Who Graduated From Montana's School of Engineering Are Becoming Prominent in Technical World---In the Smelters of the Treasure State, in the Mines of Utah Montana Alumni are Found.

Thayer Stoddard, '10, has accepted a position as timekeeper and storekeeper for Clifton & Applegate, the contracting company which was recently awarded the contract for extending the B. A. & P. railroad from Anaconda to Georgetown Flats. Thayer writes from Silver lake that fishing through the ice is excellent. To insure the importance of the position, he also adds, in a P. S. that whenever money, tools or supplies are wanted they have to come to "Stoddy."

Berney Kitt, '09, has accepted a position with the city engineer, Missoula. He has just returned to work after a few days' visit in Great Falls.

Frank Lewis, '09, writes from Vancouver, B. C., that he is in the employ of the Van Emon Elevator company, installing elevators. The news was conveyed on a postal card showing a picture of the 14-story Dominion Trust building, which was marked showing his headquarters on the seventh floor. We know Frank's environments should inspire him to reach the top story, and we wish him success in the attempt.

The annual meeting of the alumni executive committee was held at the University hall, April 10, to nominate the officers to be voted on at the annual meeting of the Alumni association, which will be held next June. The following nominations were made:

For president, Fred E. Buck and Evelyn Polleys Mason; for vice president, Homer McDonald and Moncure Cockrell; for secretary, J. B. Speer and Mary Hanson; for treasurer, Bertha Simpson and William O. Dickinson; for delegate at large, Margaret Summers and John D. Jones; members of A. S. U. M. committees: Oratory, Charles Pixley and Eva Coffee; debate, Eloise Knowles and Hugh Forbis; athletics, Gertrude Buckhous and Charles Farmer.

An amendment to the A. S. U. M. constitution has been proposed, and if made, will mean that an amendment will have to be made to the constitution of the Alumni association to work in harmony with that of the A. S. U. M. The amendment will be voted on at the June meeting.

Charles Farmer, '09, who was always identified with the "Progressives" in college activities, has carried into life with him the same desire to play the leading role. Although married, Charles is developing into a first-class baseball fan and expects to see that Missoula comes to the front this season.

The monthly alumni dinner was held April 13 in the grill room of the Palace hotel, 23 of the local alumni were present.

One of the busiest men of the city these days is County Surveyor James Bonner, '07. Fall election is fast approaching and Jim says that engineering combined with diplomacy is very trying on one's nerves.

Eddie Corbin, '06, who will be remembered as Montana's favorite ball player, is back at the University studying law. If "Shorty" does as well in court as on the diamond we will certainly expect to see him on the judge's bench in a very short time.

Joseph Buckhous, '06, and Nina Mason were quietly married April 10 at the Episcopal church. Mrs. Buckhous will be remembered as a student in the preparatory department of the University. They have gone to St. Regis to make their home on Joe's homestead. The engineers extend congratulations.

OUR GRADUATES.

1901—

G. C. WESTBY, B. S. in M. E.—Chemist, Selena, Ore.

1902—

J. F. ANDERSON, B. S. in M. E.—Deceased.

HAROLD BLAKE, B. S. in M. E.—Draughtsman, Anaconda, Mont. Member of the Twelfth legislative assembly. Secretary Spanish Treaty Claims Commission.

HOMER M'DONALD, B. S.—Assistant in smelters, Anaconda; superintendent in B. & M. smelter, Great Falls, Mont.

A. G. M'GREGOR, B. S. in M. E.—Draughtsman, Anaconda, Mont.; electrical engineer, Anaconda; sent by Anaconda Copper Mining company to Tooele, Utah, on smelter constructing; smelter engineer for Anaconda Copper Mining company; member of the firm of Ripath & McGregor, smelter engineers, constructing smelters, with a capitalization of $10,000,000.

GUY E. SHERIDAN, B. S.—Chemist, Butte, Mont.

BENJAMIN STEWART, B. S.—Civil engineering offices and U. S. Deputy mineral surveyor, Missoula, Mont.; mining engineer, Alaska.

1903—

LESLIE M. SHERIDAN, B. S. in M. E. — Draughtsman, Anaconda, Mont.; assistant mechanical superintendent, same.

1905—

J. R. HAYWOOD, B. S. in Engineering, engineer B. & M. smelter, Great Falls, Mont.

1906—

F. E. BUCK, B. S. in M. E.—Assistant in mechanical drawing, University of Montana; city engineer, Missoula, Mont.

JOSEPH BUCKHOUSE, B. S. in M. E.—Farmer, Ft. Missoula, Mont.

E. R. CORBIN, B. S. in M. E.—Mine foreman, Nampa, Idaho; student law school, University of Montana, 1912.

T. LEO GREENOUGH, B. S. in M. E.—Manager Snowstorm mine, Wallace, Idaho.

D. I. GRUSH, B. S. in M. E.—Draughtsman, Anaconda, Mont.; head draughtsman, same.

1907—

J. H. BONNER, B. S. in Engineering—County Surveyor, Missoula county.

C. S. DIMMICK, B. S. in Engineering—Electrician, Missoula Street railway, Missoula, Mont.

F. E. DION, B. S. in Engineering.—Merchant, Glendive, Mont.

J. H. MILLS, B. S. in Engineering.—Inspector for Board of Fire Underwriters, Butte, Mont.

W. H. POLLEYS, B. S. in Engineering.—Deceased.

M. De SMITH, B. S. in Engineering.—Electrician, clerk, Missoula Electrical company, Hamilton, Mont.

1908—

C. A. BUCK, B. S. in Engineering.—Merchant, Stevensville, Mont.

V. S. CRAIG, B. S. in Engineering.—Superintendent wholesale and retail lumber yard, Long Beach, Cal.

A. G. DAVIDSON, B. S. in Engineering.—Electrical engineer, Tooele, Utah.

H. C. M'GREGOR, B. S. in Engineering.—Inspector for Board of Fire Underwriters, Salt Lake City, Utah.

E. A. WENGER, B. S. in Engineering.—Wholesale meat company, Anaconda, Mont.

1909—

C. F. FARMER, B. S. in Engineering. Draughtsman, U. S. Forest Service, Missoula, Mont.

B. F. KITT, B. S. in Engineering.—Superintendent electric light plant, Plains, Mont; enginering department, City of Missoula.

FRANK LEWIS, B. S. in Engineering.—Electrical engineer, Nevada, Cal.

W. M. VAN EMAN, B. S. in Engineering.—Electrical engineer, Augusta, Mont.

1910—

H. R. DEUEL, B. S. in Engineering—General Electric company, Schenectady, N. Y.

T. T. STODDARD, B. S. in Engineering.—Surveyor, Missoula, Mont.

W. T. TAIT, B. S. in Engineering.—General Electric company, Schenectady, N. Y.; electrical engineer for B. A. & P. railway, Anaconda, Mont.

W. J. WINNINGHOFF, B. S.—Assistant chemist Massachusetts Institute of Technology, Boston, Mass.; assistant in research work, same.

1911—

O. R. DINSMORE, B. S. in Engineering.—Engineer, city engineer's office, Missoula, Mont.

F. E. GLEASON, B. S. in Engineering.—Electrician, Florence, Mont.

C. H. HOFFMAN, B. S. in Engineering.—General Electric company, Schenectary, N. Y.

H. D. MACLAY, B. S. in Engineering.—Real estate, Missoula, Mont.

S. J. REARDON, B. S. in Engineering. — Westinghouse Manufacturing company, Pittsburgh, Pa.

M. D. SIMPSON, B. S. in Engineering — Westinghouse Manufacturing company, Pittsburgh, Pa.

R. W. SMITH, B. S. in Engineering.—Surveyor, U. S. Reclamation service, St. Ignatius, Mont.; manager, Missoula Gas company.

We of the College of Engineering are not the

"Chosen People."

We are the Workers who, in the future, must and will develop the wonderful resources of the great state of Montana.

ENGINEERS' SONG.

(Tune: "I've Been Working on the Railroad.")

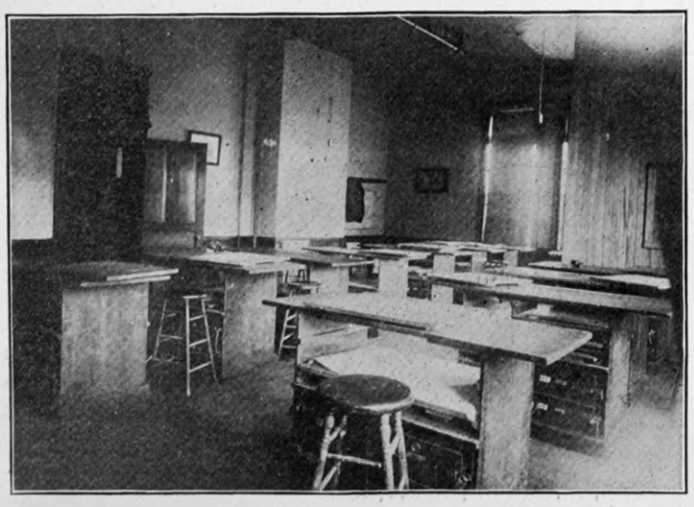
I've been working in the boiler room
All the afternoon;
I've been working in the boiler room
Just to pass away the gloom.
Don't you hear the steam escaping?
Sounds like music to our ears.
Don't you hear Prof. Richter calling?
Oh! you engineers.

Sing now to our Kaimin,
Best one of the year.
Engineers aren't happy,
Without their word of cheer.
Bozeman for its farmers,
Dillon for its dears,
Butte can have its School of Mines,
But for Montana, ENGINEERS!

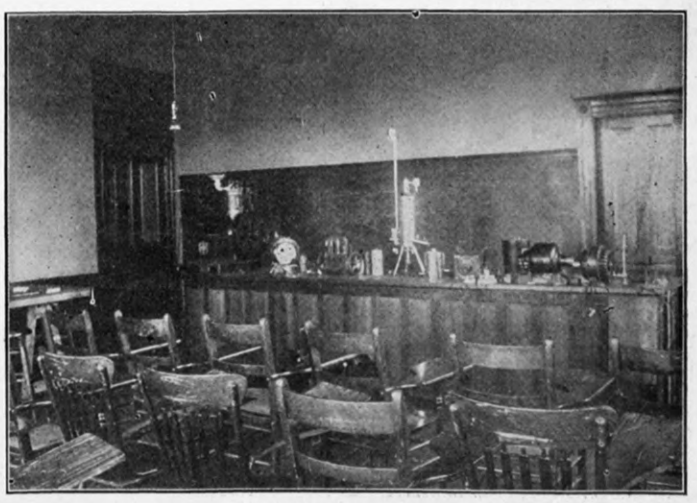
REMSEN RESIGNS.

Dr. Ira Remsen, president of Johns Hopkins University, has tendered his resignation. He will again take up his research work as Professor of Chemistry at that University.

If a train runs off the track, will the air brake?



THE DRAUGHTING ROOM.



AN ENGINEERING LECTURE ROOM.

WHAT THE RAILROAD MEN THINK OF EFFORTS OF FACULTY IN NEW WORK

HOWARD ELLIOTT
President Northern Pacific.

"I have been much interested in the movement ever since it was started here in Missoula, and I have been pleased to know, more recently, that it has been taken up among the men at Livingston. It is excellent work and the plan to interest the shopmen is commendable. We have heard nothing but the pleasantest reports from the work, and it is one of the good bits of news of the year."

—The Daily Missoulian.

EXTENSION WORK IN HELENA.

The University Engineering Extension Work should receive encouragement and support without any hesitancy, as this work benefits the state and the people therein.

Within the last six months classes have been started at Missoula, Helena, and Livingston. I have been informed that the class at Missoula is progressing rapidly, and have also heard similar reports relative to the class at Livingston.

The class at Helena has been going on about five weeks. We had two introductory lessons in electricity while the N. P. Railway was fitting up a large room in one of their buildings so we could start up the work in Mechanical Drawing. The room has been completed and we have had three lessons in Mechanical Drawing in our new quarters. We have a large class and all the boys take a great interest in this work.

This Extension Work does more good for the average young man than anything I know of. It gives him a chance to receive an education which he could not otherwise afford. Taking this work from the Railway Company's standpoint, when apprentice boys or, in fact, any of their men attend, it teaches them, and by doing so the Company derives a benefit. On the other hand, the man himself is being made into a better mechanic which puts him in a position to claim more salary and puts him in line for promotion to a better position.

W. E. DUNKERLEY,
General Foreman.

FROM LIVINGSTON.

Mr. A. W. Richter,
Dear Sir:

Regarding the work of the Engineering Extension of the State University of this state, which is now being carried on at Missoula, Helena and Livingston, and which was organized by yourself and Mr. Draper of Missoula, I am of the opinion this is a move in the right way, as you understand that the most of our skilled labor is being benefited by it. Heretofore they have not had the chance that you folks are giving them now; all that is necessary for them to do now will be to apply their energy and do their part.

I consider that you people have laid the foundation which will give the proper light and education. It has been but a few years since we scarcely heard of the University, and much shorter time since the Extension work has been instituted. There is no excuse for those, who wish to improve their time, and who have the opportunity to attend the Engineering Extension courses, neglecting to do so. The greatest trouble with us all at the present time is to neglect in this opportunity of improving in the education part, in so doing we fail to progress.

At the present day it is impracticable to say that education is not required. Twenty years ago, while working in a shop in the east, there were a few of us who wished to learn drawing; it was almost impossible to get an instructor and then after getting one we paid a high price for same, and now, to think this is all given free. Little do we think that yesterday has gone forever; today we live and tomorrow was never born.

I care not what crew of men who may be working together, when they need a leader for any purpose they never select the poorer of the crew.

Had I listened to what was talked during my first year in the shop I would probably be at other work at the present time, but wish to say it was my desire to obtain everything that was possible for me to do so, both in learning and in my work, so as to make all progress possible. For the past 15 years I have had charge of shop work, only making one move during the time, being transferred, nine years ago, to a better position for the same company. It is not my wish to stop with what I have, but hope that I may be able, with what I may attain with the assistance of the extension work you people have instituted, to climb to a higher round in the ladder of success.

I have often noticed the difference in men; some have a desire to grasp for every opportunity to learn and make an effort to progress, while others make no effort. Those who made an effort have progressed and today have much better positions.

We have what you might call the "whistle men," they do not care to exercise any energy on their own account; when the whistle blows they leave everything, do not do any studying so as to improve their own ability. This life is given us and we may improve it or idle the time away, making little or nothing out of it.

We are pleased to note the interest taken in the extension which you and Mr. Draper instituted here sometime ago. The men are very much interested in the drawing class, and it is very easy to notice an improvement in their work; this has a tendency to get them interested and to do some studying for themselves. You may readily see for yourself that this is what is and must be taken up by each and every man if he cares to make any progress and advancement in his line of work.

Men working at shop work, whom I knew 20 years ago, are at the same machine and do not seem to care to advance, but at the same time they will complain and find fault with any who tries to progress on the ground that the one who goes higher has a "pull," and has had a favor shown him. No later than one week ago there was an old man, 72 years of age, came into my office asking for assistance, he having spent all these long years and accomplished nothing.

The world moves, and with it our fellow-workmen must keep in line and keep up from day to day or they must be left with those in the rear.

There is no question, in my mind, that the opening of the Engineering Extension work of the University is a boon for the men who are able to attend the meetings which you people are giving. Am pleased to say we have had as high as 80 to attend these meetings in one evening, and we have about 34 members on the drawing class, and others who have expressed a desire to enroll.

There has been much said among the employes regarding the good of this extension, and we hope it is only in its infancy and that the good seed that has been sown may bring forth such good results that you people, who started this extension, may be well paid for same, and the fellow workmen may receive such benefit that the State University of Montana may be long remembered.

In behalf of all those in the shops at Livingston, who are interested, I wish to thank you gentlemen who came over and instituted the work, also yourself, Mr. Biegler and Mr. Cunningham for coming over and taking charge of the class. I remain,

Yours respectfully,
THOMAS JACKSON,
General Shop Superintendent, Livingston, Mont.

S. H. DRAPER, Master Mechanic of the Northern Pacific.

PRACTICAL MEN GIVE STUDENTS PRACTICAL TALK

The department of engineering always keeps in close touch with the practical world. One of the means of obtaining this result is to have men engaged in engineering enterprises lecture to the students at the University. A most instructive and entertaining lecture was delivered at the University on Thursday, January 25, by S. H. Draper, Master Mechanic of the Rocky Mountain Division of the Northern Pacific railway. Mr. Draper's subject was the "Speed Control of the Modern Railroad Train." Mr. Draper is clearly an expert on this subject. He described the operation of the air brake as applied to the modern train and showed the wonderful and almost human action of the new triple valve, which valve he designates as a piece of apparatus showing the very highest grade of ingenuity in its design. In this eloquent and instructive talk, Mr. Draper also called attention to the expensive equipment now making up a passenger train, the same costing about $20,000 per car. The care of human lives and also the care of the equipment makes it imperative that the stopping of trains be rapid and properly carried out. Mr. Draper laid particular stress upon the importance of immediate action of the brake throughout the entire train, in order that accidents may be avoided, and also called attention to the fact that the triple valve made this possible. The improvement of the air brake must keep pace with the development of the car service. As the number and weight of cars increase, the action of the air brake must become more perfect in order to avoid serious accident. The lecture was very much appreciated by us.

The students also appreciate the recent lectures by George B. Conway, State Accountant, on "Accounting Systems," and Sidney R. Inch on the "Repair of the Bonner Dam."

Mr. Conway gave a very instructive talk on the development of the accounting system, and also demonstrated the different systems in use in manufacturing plants.

Sidney R. Inch, General Manager of the Missoula Light & Water company, gave a very entertaining and instructive lecture on the "Reconstruction of the Bonner Dam." The lecture was illustrated by lantern slides and gave us a clear conception of the manner in which this work was carried out.

HOW THEY DID IT.

R. Justin Miller, one of the debaters who helped to defeat W. S. C., last night told the members of Hawthorne how the trick was turned.

Men are judged by what they can do and particularly by what they accomplish.

NORTHERN PACIFIC RAILWAY COMPANY
Office of the General Superintendent.

C. L. Nichols,
General Superintendent.

Livingston, Mont.
April 6, 1912.

Mr. S. H. Draper,
Master Mechanic, Missoula.

Dear Sir:

In reply to your favor of the 4th instant relative to University Extension work:

There is only one line of talk that can be made on this subject and that is in favor of it. The people in charge of the University work are certainly to be thanked for the interest which they have taken and the time they have put in, not only in getting the men interested but in teaching them after they once got the work started. Anyone who wants to be convinced as to the good that can be accomplished can easily be convinced by making a visit to the clubrooms for that purpose in Livingston.

There are a number of young men in the shops at Livingston and also at Missoula, and they seem to realize very forcibly that in order to be a successful man in their line of work it is necessary to be educated, and it is more than gratifying to note the interest which these men take in their work.

Touching on the personal side of it, it might be well to say that my youngest son, 17 years of age, who is in the high school, is becoming interested in the extension work of the University and has enrolled himself with the class at Livingston, figuring that the benefits which he will derive from the course will be of much value to him when he takes up his college work.

I believe it was not understood, until the men in charge of the University called attention to the fact that the people were entitled to this by reason of being taxpayers and supporting the University. Many of them thought that in order to get any benefit from the University course it would be necessary for them to go to Missoula and enter as a student. Too much cannot be said in the way of praise for the men in charge of the University who let this be known and followed the work up in the manner which they have.

Yours truly,

(Signed) C. L. NICHOLS.

EXTENSIVE EXTENSION WORK BY THE PROFESSORS OF ENGINEERING

Until a comparatively recent date the idea obtained that higher education belonged to a privileged few, that it was unnecessary and perhaps even undesirable for the average man engaged in practical pursuits. Formerly a wide distinction was made between the so-called theoretical and the practical man. During late years it became generally understood that education was the birthright of all and that it was the duty of each and every one to spread knowledge to the best of his ability. This idea of the universal transmission of knowledge has led to the development of the greater universities.

A greater university is one which not only teaches the young men and young women who come within its walls, but also reaches the homes and workshops of the people of the state, wherever they may reside, and spreads knowledge by all means in its power. Well might we quote from the Educational Review, the following words by President Van Hise:

"In proportion to the resources, I believe larger results for the world will be obtained by that institution which recognizes local responsibility than by the institution which feels no special obligation to the community in which it happens to be located, and has simply before it as its ideals, pure culture, pure learning, pure science, with little or subordinate thought of immediate service."

The term "local" here refers particularly to the state and not to the city in which the University happens to be located.

The different state universities have, of recent years, begun more fully to realize their obligations to the whole state. The University of Montana feels deeply its special obligation to the state and is doing what she can, through her extension courses, to meet the needs of the people of the whole state.

The College of Engineering of the University of Montana has been very successful in doing its share of the work required of the greater university. About two years ago attention was called to the value of engineering extension work and the benefits which might come to the people of the state if engineering instruction were given to all citizens who might desire such information. Following correspondbetween the President of the University and President Elliott of the Northern Pacific railroad and with the hearty co-operation of Superintendent Burt and Master Mechanic Draper, classes were organized in Missoula early in November of last year. The work has since been extended to other points and has met with marked and almost unprecedented success. As the work of the season is closing we note that the classes are all well attended and as popular as in the beginning.

The work is given by lectures and by discussions and recitations. As the classes are held in the evening it should be noted that the engineering professors devoted many evenings to the work in addition to their arduous duties at the University in connection with their regular University work. In addition, several men who work at night, and who therefore cannot attend the night class, applied for a day class in mechanical drawing. This class was formed and is enthusiastically attended.

During the past year the following work was given in the extension division of the School of Engineering:

1. The Power Station, by Professor Richter.

This lecture was illustrated and dealt with the transformation of energy in the power station. Sources of energy and losses occurring in the transformation of energy were discussed.

2. Shop Calculations, by Professor Cunningham.

In this work the lectures discussed such simple problems as occur in connection with the routine shop work. The work was supplemented by practical shop problems which the student was required to solve in the class room.

3. Mechanical Drawing, by Professors Richter and Cunningham.

The students taking this course received instruction in the use of drawing instruments, the development of surfaces and making drawings of machine parts.

4. Electrical Machinery, by Professor Biegler.

In this course the students studied the elementary principles involved in the construction and operation of electric generators, motors and other electric appliances.

5. Heat and Steam, by Professor Richter.

CLASS IN THE MISSOULA SHOPS.

In this course the subject of heat was taken up. This was followed by a discussion of the advantages of compound locomotives, superheaters, condensers, etc. Cylinder condensation and the advantages and disadvantages of different forms of engines were studied.

Among other subjects to be offered will be a study of the locomotive and other valve gears, gasoline and other internal combustion engines. Advanced courses in electrical machinery; drawing and simple building construction, will also be offered.

It is intended that as more funds become available, the instruction may be extended to all the industries of the state. In this way the University may serve all the people of the state. Let us hope to look forward to the time when all the people, of all the state, may be served by the University, receiving such instruction as may be best suited to their needs. No matter how elementary or how advanced instruction may be, it is the pleasure of the University to supply the demand. No person is too old to learn, the engineering classes have enrolled men of all ages, boys of 16 and men of 60. To efficiently give instruction to the men and women engaged in industrial pursuits requires the best talent the University can furnish. To men of high attainments this work also becomes a pleasure.

FROM MR. DRAPER.

Engineering Extension Work.

While University Extension Work is not a new departure along the line of educational work, it having been introduced in the older states some years ago, and, although our State University has been in operation for several years, extension courses were not taken up to any great extent until about a year ago, at which time President Duniway suggested to the Northern Pacific Railway officials, President Howard Elliott and Third Vice-President George T. Slade, the desirability and great advantages to be gained by University Extension Work to the people of the state, and especially the course of extension work as given by the College of Engineering of the University of Montana.

While it may be said that the University owes it to the people to teach any subject that will be of benefit to anyone who may apply for such instruction as desired, yet it remained for someone to take the initiative, which was done when President Elliot and other Northern Pacific officials and the University authorities decided that the work should be first started and inaugurated at Missoula, and, if successful, extended throughout the entire state.

Beginning Is Made.

The work having been duly authorized, the Northern Pacific local officials, Mr. Burt and Mr. Draper, proceeded with President Duniway and the Engineering faculty to inaugurate the great work by calling a meeting of employes, at which meeting the men were addressed by President Duniway, Superintendent Burt, Professor Richter of College of Engineering and Mr. Draper. Great interest was manifested by all, and after a thorough discussion of the subject, it was decided to have classes in shop calculations, electrical machinery, and mechanical drawing. The first lecture of the course was given early in November by Professor Richter, on the subject of "Transfer of Energy in the Power Station." This lecture was a veritable intellectual treat, the subject being handled in a masterly manner. The professor also paid a glowing and just tribute to James Watt, the greatest mechanical engineer the world has ever known. Professor Beigler has given a course of six lectures on electrical machinery, electrical transmission and telephony, treating of the construction and operation of electrical machinery. Points of special interest to the shop and road employes of the Northern Pacific were dwelt upon, the professor clearly demonstrating the science by use of drawings and other appliances in a most able and thorough manner. Professor Cunningham also gave a course of instruction in shop calculations. In this course such shop problems as are of use to the machinists are studied and the men are taught to make their own calculations in the work they are to do. Professors Richter and Cunningham conducted classes in mechanical drawing. The men are taught the use of drawing instruments. This is followed by instructions in drawing, first on simple machinery, following as the class progresses with more complicated parts.

The picture shows the class in session, with General Shop Foreman J. W. Hallett in the foreground, Professors Richter and Cunningham and Master Mechanic Draper standing viewing the work of the class, which the professors claim has made rapid progress. Much credit is due Foreman Hallett, as he has from the first taken a leading part and when it comes to shop mathematics and shop work he is there with the results; in fact, the class as a whole is a fine set of men, and well advanced along mechanical lines.

Recently, Professor Richter gave a series of lectures on Heat and Steam. The Professor first demonstrated what heat meant and then discussed the perfect engine. Following this he discussed those things which cause loss or gain of efficiency, as for example: Cylinder construction, condensers, compounding, superheaters, etc. These subjects are of great interest to the men as they have a very practical bearing. Even though the lectures dealt with very technical subjects, the subject matter was presented in such a simple manner as to be intelligible and comprehensible to those whose early training has not ben such as to enable them to easily grasp the principles and theories involved.

Shortly after inaugurating the extension work at Missoula, Professor Richter and Mr. Draper went to Livingston and Helena for the purpose of telling the men about the extension work as conducted by the Engineering Department of the Uuniversity. After Professor Richter and Mr. Draper had addressed the large number of assembled and interested employes, Mr. Thomas Jackson, general shop superintendent, was called on. In response Mr. Jackson delivered one of the best and most practical talks on the great advantages to be gained from University Extension Work. The talk began with the struggles, as experienced in his own life, to obtain the very information which the Engineering College offers to give with such a lavish hand. Among other things he dwelt upon the great additional expense and personal sacrifice required when preparing himself for the advanced position he now occupies. His opinions as to the advantages occasioned by the student coming in close touch with efficient and experienced instructors were presented clearly and eloquently.

General Agent W. E. Bennett is deserving of great credit for his assistance and co-operation in assisting and in organizing the work at Livingston. In his address to the men he dealt particularly upon the advantages to be derived from engineering extension work and the great saving which would accrue to the men and the state by the fact that this extension work is carried on by the Engineering College of our own University. Mr. Bennett is ver yenthusiastic concerning the results which have since been obtained.

At Helena, special credit is due Mr. W. E. Dunkerly, general foreman, and his foremen, Messrs. King and Mattmiller, who headed the petition requesting that engineering extension work be inaugurated at Helena. The continued interest manifested at Helena is most gratifying and encouraging.

At the present time classes in mechanical drawing are being conducted at Livingston and at Helena. The men are very enthusiastic about the work at both places.

Great interest is shown by the enrollent in each course; there are a total of about two hundred course students up to the present time. It is interesting to note that Helena has the largest percentage of enrollment of any point on the line. The enrollment practically includes every person engaged in mechanical pursuits at this point of the line.

The interest and attendance keeps up and the men often work to a late hour with the professors in attendance, even though the work is scheduled to close at 9 p. m. The great interest shown by the class and the professors is evidence of the success with which the extension work is meeting. As the classes progress, other courses will follow, such as valve gear, valve setting, including a study of slide valves, piston valves, Stephenson link motion and the Walschaert valve gear, which are now used quite generally on the modern locomotives; also a course on fuel economy and combustion, including the use of the different kinds of fuel for steam generation. All of this is offered by the University faculty, absolutely free of charge other than the slight expense for textbooks, drawing material, etc.

Before closing, I cannot refrain from pointing out to the students and those who should become students, the fact

(Continued on Page Eight.)

A CLASS IN THE LIVINGSTON SHOPS.

TRAINED FOR THE JOB

A STORY OF MODERN METHODS

By Coming Montana Engineer.

On the first floor of the Denver & Southern Railway building there is a room which none may enter unless summoned; a room with massive oaken doors and sound-proof walls. Seated about the table were 12 men, who, with the president of the road, formed the board of directors; every head was flecked with gray, and two were silvery white. The faces of these men were the alert, well controlled, thoughtful faces of power; not the faces of those who do things, but of those who cause things to be done; not the faces of those who are themselves powerful, but who control and direct power; courageous, but with a courage not personal—a courage born rather of an exact knowledge of the strength and power at their command; confident, not in their own strength, but in the power they control and direct.

The man at the head of the table had risen. "Gentlemen, I think it is hardly necessary to explain the matter which has brought us together. President Holmes, have you anything to say?"

The president arose:

"As you well know, gentlemen, there have been three serious wrecks on that piece of track in the last year. One hundred and twenty-four lives have been lost, and the monetary losses to the company have amounted to over a million and a half. We have had the best engineers, the best dispatchers, the best equipment that money can obtain. My chief engineer, a man on whom I rely implicitly, has gone over the ground thoroughly, and tells me that no other route through the pass is practicable. As you know, every other pass is controlled by other roads."

One by one, the directors arose and discussed the situation; none had any suggestion to offer, or any criticism. Finally, the chairman called on the last of the twelve.

"Mr. Chairman," he said, "for the past few months I have been carefully studying the grave situation which confronts us. I have consulted with a young engineer who has also made a thorough study of the matter, and after considerable trouble he has convinced me that a change of route is practicable, and is the one solution for our present difficulties. At my expense he has made preliminary surverys, and he is now prepared to present to you the data he has gathered. I should like to have Mr. Merritt report directly to you."

The engineer was summoned. His appearance resembled and yet differed from that of those about him—his, too, was a face of power, but if their faces were well controlled, his face was a mask which none might pierce; every line of his face teemed with power, personal power and personal confidence and courage; steel gray were his eyes—eyes that looked one through and through, but revealed never a hint of what passed on in the brain behind them. He laid before them the data and reports of his survey, and pointed out on the map, his proposed route from Telluric to Ames. Five miles north of Allen Pass there is a narrow, box-canyon, perhaps 200 feet in depth, a mile in length, and at its widest point, 100 yards across. Blocking its western end, the main range of the Rockies rises a thousand feet above in solid walls of rock. Half way down the canyon, Lost River falls over its high sides, and, following down the bottom of the canyon, disappears among the rocks at its lower end. Had the river, instead of losing itself in the bowels of the earth, pierced a tunnel through the few hundred feet of rock which barred its way, it would have found itself in the center of Devil's Slide, 500 feet in height. Thence it would have dashed onward in a series of magnificent falls, to join its forces with those of the Grand Colorado.

"From Telluric, with a two and one-half per cent grade, I would extend a single track five miles around Iron mountain. From that point I would connect with the Devil's Slide end of the tunnel into Box canyon by a long trestle; through Box canyon I would lay a double track, and at its upper end I would blast out "Summit Tunnel." From the western end of Summit Tunnel it would be an easy matter to connect with Ames, 10 miles away. This would make the total distance between Telluric and Ames a little under 30 miles. In conclusion, Mr. Chairman, I would lay before your board the following proposition. I will put in a new roadbed across the summit, connecting with the present main line at Ames and Telluric. I will agree to finish the work in eight months; that is, by September 1, 1911, and will guarantee the safety of every rail. You, on the other hand, are to guarantee to me all expenses and an additional salary of $25,000 for my services as consulting and supervising engineer, and you will further bind yourselves to leave the entire management of the matter in my hands."

Trained as they were in the school of self-possession, the members of the board could not conceal their amazement. Speechless they gazed at this young engineer—he could not be much more than 30—who proposed to put in a roadbed which the chief engineer of the road had pronounced impracticable! The idea was preposterous. At last the chairman found his tongue. "You are mad," he gasped. "The plan is neither feasible nor practicable."

"Gentlemen, I was never more serious in my life. It is because I am thoroughly convinced of the practicability of the plan that I have brought you my report.

After a heated discussion, it was finally decided, half skeptically that, since no other way out of the situation had been suggested, the board would adopt the young engineer's plans, providing he would put up a $250,000 bond, to guarantee the success and utility of his venture.

From north and south, from east and west, gathered the forces of advancing civilization; surveyors, gang bosses and engineers, hastened to the scene of activities, for word had gone forth that big Jim Merritt, beloved of all his profession, was making "heaping much smoke" near Allen pass.

Hardy and tanned were these men, college bred for the most part, and tried and proven in the field of personal experience. Many had been with him on some former job. They knew him well as "Chauncey" Merritt or "Chief," the best civil engineer that ever led a surveying party in the advance guard of civilization; some had known him in the old days at "Boston Tech," while many another had seen him carry Cornell's ball across Yale's goal line for the only score made against Yale that season, and so they came together from every direction to work under their old chief.

At both ends of Devil's Slide and Summit tunnels, blasting gangs began their work, and the sound of their shots reverberated from peak to peak and range to range, often starting on some distant mountain side, an avalanche of rock and snow. At last Devil's Slide was pierced, and a temporary wooden trestle built 900 feet in length and, at its highest point, 285 above the ground. This finished, men were rushed to the main tunnel, and work there was pushed with a will, as but six months remained. Even while they blasted in the main tunnel, other men followed, and with them came the "Chief's" old roommate, "Joe Casey, M. E.," as he always signed his name, to superintend that part of the work. Near the great Lost River falls they erected an enormous power plant, and eight electric locomotives arrived to draw the trains through the tunnel. For five months they blasted and tunnelled, and finally came the day when the last shot was fired and the four long, shining threads of steel from the east met those stretching out from the west. Then it was that the inevitable happened. Up on the old main line there is a place where the tracks skirt Pinnacle peak, on the summit of which rests the Balanced rock. Was it the wind that toppled over the rock? Who may know? But down it came. Straight down a hundred feet it fell amidst the rocks and snow, lay still a moment, then slowly slid on down the mountain, gaining speed and volume at every foot, until with a roar, it leaped onto the D. & S. tracks and buried them far below thousands of tons of loose rock and snow.

In the dilemma, the directors in despair, turned to Engineer Merritt. The C. & B. had offered them the use of their tracks temporarily. How soon could he have the new route open for traffic?

"As you will notice, gentlemen, the total ditsance from Telluric to Ames is approximately 28 miles; the grade on the eastern slope is 2 1-2 per cent; that on the western slope is 3 and 1-10 per cent. From Telluric to Box canyon there is a single track, and from Box canyon to Ames a double track. At either end of Summit tunnel there are roundhouses in sufficient size to care for all engines held over. The signal apparatus is not all in place, but the two telephone lines between the ends of the tunnel are working. If you will grant me an extension of time on the trestle, there is no reason why you should not run your traffic this way tomorrow. If the time extension is granted, I will undertake to replace the present wooden trestle by a 17-span steel trestle 870 feet in length and 280 feet in height at the highest point. I will build this in exactly the same spot on which the wooden trestle now stands, and I will not delay a train."

A month later these same men stood on the steel structure which had magically supplanted the old wooden trestle. "It is a wonderful piece of work," President Holmes said to Merritt. "Wonderful in that it shows not only the great technical ability of its designer, but also his great executive ability. It has supplanted the wooden trestle during the heaviest traffic of the year without delaying a train."

The others were equally profuse in their praises. Even while they spoke the last spike was driven home, and the workmen hurried down the trestle. In making room for them to pass, "Chief" Merritt stepped on the end of a loose plank—it tipped, a cry rang out, then all was over.

In the books of the Denver & Southern there is today no mention of "Summit Tunnel." Should the traveler alight from a train while the great steam engines are being changed for the electric locomotive which is to draw the train through the tunnel, he will see on either side of the tunnel entrance two large bronze plates. One of these bears the inscription:

"The James B. Merritt Tunnel. Length, 11.9 miles (62,778 feet.) Height, 20 feet. Width, 20 feet. Altitude above sea level, 8,756 feet."

On the other is engraved:

"In memory of James B. Merritt, Engineer, whose great genious gave to the Denver & Southern railroad one of the finest mountain roadbeds in the world. Fell from Merritt trestle September 27, A. D. 1911."

FROM MR. DRAPER.

(Continued From Page Seven.)

that the road to success and distinction is open alike to all. The opportunity for advancement is not confined to those who have the time and opportunity to attend the University. Through the courtesy of the state, the University, and particularly the College of Engineering of the University, this opportunity is brought to their very door.

While arduous study and the time consumed may be considered a sacrifice by some, yet past experiences clearly demonstrate that there must always be a corresponding sacrifice when good is to result. Endless examples could be cited to verify this.

Future Promising.

The work which has been started gives promise of great future development and if properly supported by the people, it will, undoubtedly, soon rival the great extension work of other state universities, and it is the duty of every citizen of the state to come out loyally and support the state's greatest educational institution, the University of Montana, which, in its several departments, is ready to so efficiently meet the wants and needs of the people of this great state. The great benefits to the engineering interests of the Northern Pacific and the electrical employes, and the people of the state in general, is immeasurable as it extends to and comprehends every industry of the great state of Montana, which is blessed by nature with the greatest and largest amount of natural water power, great railway systems and the largest and greatest mines of the world, which are but partially developed. What does this mean to the mechanical, electrical and mining engineers, also the proficient mechanics? It means simply this; That there will be work at good paying salaries for all who are skilled, trained and qualified to carry forward the development of the great natural resources of this great state.

S. H. DRAPER,
Master Mechanic, Rocky Mountain Division of N. P. Ry.

PROFESSOR P. S. BIEGLER
Electrical Engineering.

ENGINEERS' CLUB WAS STARTED IN '03

In nearly all walks of life, when a number of people are bound together by a common interest, there springs up sooner or later an organization of these people, having for its object the study and improvement of their work or protection of their rights and privileges, which binds them to one another. All alike, if truly interested in their work, will band together to further that interest. Without an object these organizations would have no purpose and, eventually, no place in the life of the world.

Sometimes the development or evolution of these secondary organizations is rapid, and again it may be slow. But it is a pleasing fact to note that these organizations generally appear, grow and spread in influence. Considering only the economic side of life and of that, only the technical part, we may apply this seeming law to one phase of the technical world, namely, that of engineering.

Now, dealing with the growth and development of engineering organizations here in the University of Montana, it is evident that first came the department of engineering at the time of the opening of the University in 1895. This must first become settled and established, thus laying a foundation for future organizations.

It might be well here in considering the growth of our engineering societies to quote from the Monthly Kaimin of these early days:

May, 1899: "The boys in the Mechanical Engineering department, under direction of their chief professor, J. H. Wells, are proving themselves useful as well as ornamental by directing their services to the public good. The instructor's platform in the gymnasium is one of the products of their skill as well as the sidewalk, for which they have the thanks and praise of all."

It is not the work which they did, as quoted, but the spirit of fellowship in their work, that tended to draw these engineering students more closely together. Though members of the student body of the University, they were also members of a department of that University. And it is this feeling, perhaps unrecognized at that time, that later expressed itself in the organization of clubs and associations.

Probably the first rudiments of a community interest in engineering are found, when, on Friday evening, March 27, 1903, a small group of men gathered in the back room of a little cafe, down town, to pay tribute to the only one of their number, Leslie M. Sheridan, to be graduated that year from the Department of Engineering of the University of Montana. During the course of the banquet, probably during that time when toasts are in evidence, some one suggested that an engineers' club or association be formed. This idea was carried out by the 24 men present, and the club became known as the "Mechanical Engineers' Association." It was planned that the program of the meetings should consist of debates on some engineering problem, essays on the lives of men who had accomplished much in the engineering world, readings on some of the new mechanical devices and discussions of things of interest to engineers.

This "Mechanical Engineers' Association" was, however, soon displaced by the "Associated Engineers." It is probable that this practically amounted to the same thing. Maybe it was better organized than the original club, or it may have had a more far-reaching effect, but whatever the reasons for the change, that change was effected and the "Associated Engineers" flourished until 1909.

The carer of this society was bright and will long be remembered by the students of that time as well as by those to whom their work has become tradition. They appeared in many of the student activities throughout each year, and an event always looked forward to, was their annual banquet.

At one time, in 1905, the society planned to publish a "Journal of Technology," and each year they published one issue of the Monthly Kaimin.

The banquet of '09, held in the gym, was the sixth and last annual event, and even before this, interest for some reason, had died and in December, 09, the present Engineers' Club" was organized.

This appeared as a result of the realization on the part of the students and faculty that such a club was needed. The objects of this club, as set forth in its constitution, are "to give the members an opportunity to present and discuss topics of interest to engineers and to promote good fellowship." The membership consists of the engineering students, the engineering faculty and professors of allied subjects. There is also an honorary membership composed of alumni members of the "Club" and of the old "Associated Engineers." There were many signers of the constitution, and many members have since been enrolled. The meetings are held in Science hall on the evening of the first and third Wednesdays of each month. At these meetings the future "Watts," "Steinmetzs" and "Wadells" present and discuss papers on modern engineering achievements and problems. Frequently the members are fortunate enough to secure men of practical experience in engineering to give talks or lectures on some subject. At the close of the talk, the meeting is opened for questions and discussions. The value of such discussions to the student can hardly be overestimated. It develops his ability to stand up before a group of men and talk intelligently to them concerning his work. This is often required of the professional engineer in charge of engineering work when called before a board of directors or his superiors to discuss questions of engineering and explain and perhaps even defend his position.

The "Engineers' Club" looks after the social as well as the intellectual side of a University training. In addition to its regular meetings, several smokers are given each year at the home of Professor Richter. During the current year the Northern Pacific employes and the forestry students were entertained in this way. The evenings are devoted to games, music, speches and the usual feed. They are always looked forward to with a great deal of anticipation, for we are always sure of a jolly good time. The "Engineers' Club" is still a flourishing and popular organization.

Regarding present organizations, there is also a local engineering fraternity, "Mu Sigma Epsilon," which was founded in the fall of 1908.

When one stops to glance over the history of the various organizations of the department, and the future prospects of development, it is not hard to believe that this present stage is but a step in the evolution of greater ideas which may appear in the future, for such things seldom remain at a standstill, but grow or decay, and the past, present, and future indications are that the engineering organizations of the University of Montana will grow.

Ferryboat sank in the Nile near Cairo. Result of a collision with another steamer.

ENGINEERS PROMINENT IN ALL STUDENT AFFAIRS

IN ATHLETICS, DEBATE, GLEE CLUB, EVERYWHERE, ARE THE KNIGHTS OF RULE.

There is in the University of today, another field than work, and that is the field of student activities. Football, basketball, and track, society, debating and drama, all lay claim to the services of our Engineers. Football, coming as it does at the beginning of the school year, perhaps creates the greatest interest among the students. In football this last year we have been represented by five M men. Conners, Klebe, Simpkins, Day and Manager Thieme all helped to fight Montana's battles on the gridiron. We will lose two of these men, Thieme and Connors, by graduation, and we hope to make an even better showing next year. "Shorty" Whisler is already engineering our next fall's schedule. "Shorty" knows the game from A to Z, and promises us the best schedule we have ever had. Indeed with games already scheduled with Gonzaga, Whitman and the Utah Aggies, as well as the Montana games, nothing further could be asked.

When the last game is over and the plays have been discussed from every

E. W. FREDELL
President Engineers' Club

aspect, comes the call to basketball. Here, too, we have been well represented this last winter. Manager Baker arranged the schedule to the satisfaction of all concerned. "Shorty" Whisler and Dan Connors then stepped in and played their usual cyclonic games at forward and center, aided occasionally by Seedy and Klebe. We will but call your attention to track and baseball; they will soon be here to speak for themselves.

To turn aside from athletics, we find engineers in other student activities. The Montana double quartette owes its success in no small measure to the engineers. Leo Baker managed it during its first season, 1910-1911, and Fred Thieme managed it the season of 1911-12. Three engineers, too, Baker, Dobson and Peppard, have this last year joined in swelling its tuneful melodies.

When we turn to drama, we find Wade Plummer managing the plays with gratifying financial success. In oratory, Frederick Richter, our youngest freshman, carried off second place in the Buckley oratorical contest, then duplicated the feat by winning the place of alternate in the Pullman debate. On the Sentinels, we find Fred Thieme, manager of the 1912 Sentinel, and H. H. Kuphal, manager of the 1914 Sentinel. Representing us in student organizations, we have Fred Thieme and Leo Baker as members of the executive committee of the A. S. U. M., and last, but by no means least, the president of the senior class, Fred Thieme.

We point out these few facts to show that the Engineers are able to engineer other things than engineering, and that they are well represented in every branch of student activities.

ENGINEERING LABS ARE WELL EQUIPPED

The average technical school, years ago, did not train young men in a manner to make them of immediate use to the manufacturer. It was absolutely necessary for a young man to learn a trade either before or after he had completed his University work. Today an entirely different condition and spirit prevails in our technical schools. With the introduction of laboratories and shops practical training is in large part supplied by the University. The young man graduating from an engineering school is better fitted to solve the problems which arise, and as a consequence, his advancement is very rapid as compared with that of those men who have spent four or five years in learning a trade, and who soon reach a limit. This rise of the graduate, in engineering is due to the training he has received along theoretical, scientific and practical lines.

This change has been accomplished in enginering because the men who are in charge of the work and are teaching in engineering are practical men with scientific training, and also because they keep in close touch with the scientific world. Years ago the teacher was primarily a teacher and theoretical man. Today he must be not only a teacher, but also an expert, an authority, an investigator along his own line of work. This change from the theoretical to the practical, as well as theoretical engineer in teaching, has resulted, first of all, in the establishment of laboratories in our prominent engineering schools. A well equipped laboratory is a necessary adjunct. In the class room the students are taught the theories which underli the engineering problems, in the laboratory they are given the opportunity to apply this theoretical information and are trained along lines which enable them to meet the practical conditions of outside life.

The laboratories of the University of Montana are well equipped with the various forms of apparatus which are necessary to illustrate the problems met with in the class room. The student is thus able to solve problems met with in practice, training him to think for himself and to do things. In addition, he learns to operate the different forms of machines.

The steam laboratory contains a Wolf refrigerating machine, direct connected to a Murray Corliss engine. This machine was manufactured by the Fred W. Wolf Co., of Chicago, and is exceedingly valuable for the study of the processes of refrigeration. Students study the principles involved in the transfer of heat during refrigerating processes and also determine the cost of refrigeration. The machine is equipped with condensers, brine cooler, tanks, pumps, and all necessary instruments for the making of complete tests.

The Corliss engine is used for engine tests in order to determine the steam consumption, for the setting of the Corliss valve gear and for practice in the operation of engines of this type. The laboratory also contains a high speed engine, steam boilers, pumps, injectors, steam indicators, etc., all of which apparatus is available for tests and other laboratory instruction.

The gas engine laboratory contains several forms of the best type of gasoline engine. These are two engines manufactured by the International Harvester company of America. A Sta-Rite gasoline engine, manufactured by the Reliance Iron and Engine company, and a Gade engine, manufactured by the Gade Bros. Manufacturing company. There are also carburetors, gas engine indicators and other apparatus necessary for making complete tests of internal combustion engines and for investigating the thermodynamic principles involved in their operation.

The fuel laboratory is well equipped with apparatus enabling thorough and complete tests of the various forms of coals, liquid fuels and gases. There are Parr coal calorimeters for the determination of the heating value of solid fuels; Junker gas calorimeters for determining the heating value of gases; Hempel and Orsat apparatus for determining the constituents of gases; also apparatus for determining the approximate analysis of coals and other solid fuels.

The equipment of the dynamo laboratory includes one 15 KW., 110 volt D. C. generator, one 10KW., 220 volt D. C. generator, and a 10 KW., 3 phase 110 volt alternator, with exciter, for general current supply. There are also one 15 H. P. 220 volt D. C. motor, a 6 H. P., 220 volt series motor, a 5 H. P., 3 phase squirrel cage induction motor, equipped with autostarter, a 2 KW. six-ring rotary converter, a small interpole motor and a small 2 phase induction motor. All of the dynamos are of recent design from the leading manufacturers in the country, and the laboratory, having been recently developed, is nearly free from antiquated apparatus. The supply of measuring instruments, rheostats and testing auxiliaries keeps pace with the dynamo lay-out.

A unique and important feature of the laboratory plan is the method of mounting machinery. Each dynamo has its individual stand, heavily built and braced, so as to put the machine in a favorable position for inspection and testing. The sets, including dynamo, rheostats and stand, may be moved as a unit for any combination of apparatus that may be desirable. The facilities for work in engineering are being greatly increased by the addition of a standard Reichsanstalt photometer, with improved Dummer Brodhum sight box. This apparatus opens up a very attractive line of experiment and research, since the development in electrical illuminants within the last four or five years has been truly remarkable.

The cement laboratory contains a Fairbanks-Morse cement testing machine, together with other forms of apparatus and appliances for the testing of the various cements used in building construction. Long time tests are being conducted. There is also a brick testing machine for the testing of paving brick.

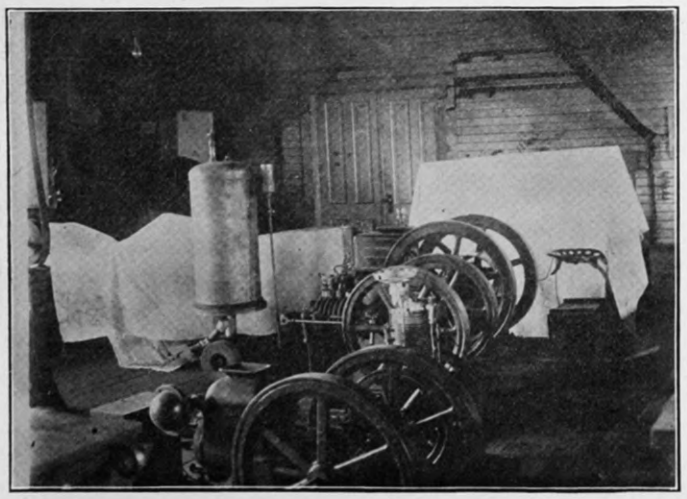
The surveying equipment includes various forms of levels and transits, with solar attachments, etc., also hand levels, barometers and other apparatus necessary for adequate instruction in surveying.

Well equipped drawing rooms are at hand for drawing and design. There is also a reading room, containing many of the leading technical periodicals of the day. These periodicals are furnished regularly and are always at hand for student use.

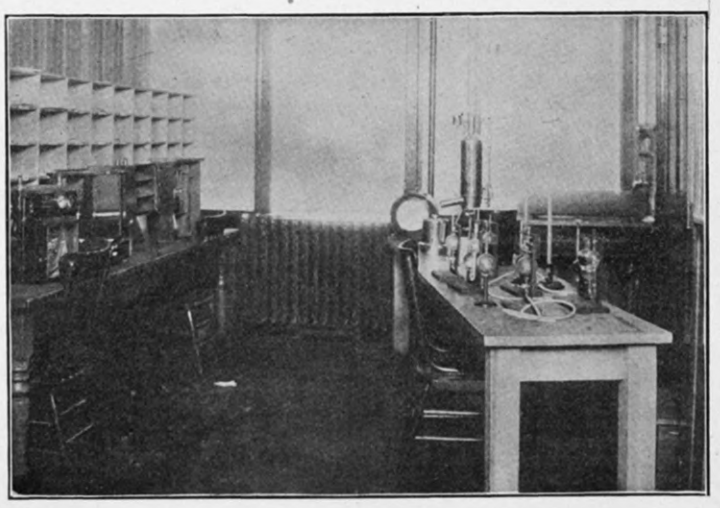
The shops are well equipped with lathes for wood and iron turning; there are also drill presses, shaper, a Brown & Sharpe milling machine, a Wells cutter and reamer, grinder and various other apparatus and small tools. Benches and bench tools are also provided for instruction in bench work in wood and iron.

The forge shop contains eight down draft Buffalo forges and anvils and also the various small tools necessary for instruction in forge practice.

In the foundry there is a cupola and other appliances permitting instruction in moulding and casting.



VIEW IN GAS ENGINE LABORATORY.



FUEL ANALYSIS LABORATORY.

AS OTHERS SEE US

SCIENTIFIC ENGINEERING.

By Frederick J. Haskin.

It is only within the last half century that engineering has ranked among the learned professions and only within the last decade or two that the term has been broadened to include so many varieties of work. The term "engineer" may now be given to the master of any applied science. The universities are including under the courses leading to the degree of master of engineering many things other than structural and mechanical technique. According to a modern authority the work of an engineer must include three things; a knowledge of what needs to be done; a knowledge of how to do it and what materials to select, and finally, the ability to execute the plans and carry them to completion.

Different trades and sciences are included in the several branches of the engineering profession but every properly qualified engineer must have knowledge of the fundamental principles of chemistry, physics, mathematics, and mechanics. He also requires a love for scientific study for its own sake as well as a talent for the practical application of its principles. The scientist may be more or less a dreamer, but the scientific engineer must be a practical man as well as a scientist.

Formerly, civil and military engineering were the only two branches recognized. Civil engineering consisted merely in the construction of buildings and the survey of lands. Military engineering included fortifications and means of offense and defense in times of war.

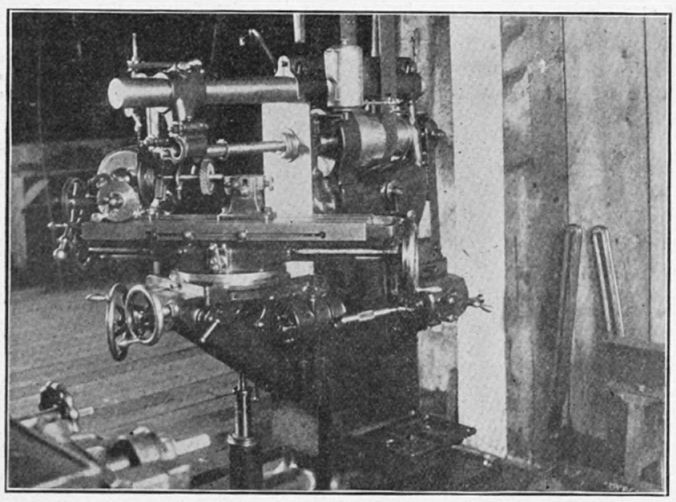
Now, civil engineering includes in addition to its former branches, highway engineering, with the various problems of bridge building, and other things that enter into the construction of modern highways. It may include hydraulics in river and harbor improvements, irrigation and canal construction and also exhaustive studies pertaining to foundations, masonry and other architectural problems.

The courses in mechanical engineering may be closely allied to those required by the civil engineer. In fact, the dividing lines between the different branches of engineering are not finely drawn. The mechanical engineer must know how to construct a boiler or an engine but he may also be required to design the power station which is to hold them.

The University of Cincinnati last year added to its mechanical equipment a $300,000 engineering building and a $150,000 powerhouse.

The salaries paid to the trained mechanical engineers are well worthy of the consideration of those who are dependent upon their chosen calling for a living. Without taking into consideration the exceptional salaries, which come as a result of exceptional ability or unusual good fortune, a New England college of engineering has ascertained that the average salary received by a graduate mechanical engineer is $1,000 for the first year and 50 per cent of those covered by the canvass were receiving $2,000 by the end of the second year. The highest salary paid at the end of the fourteenth year was $8,000 and the lowest salary at the end of the twentieth year was $5,000.

Electrical engineering is rapidly developing into one of the most important branches of the profession. The ever-increasing use to which electricity is put creates a seemingly endless demand for the trained electrical engineer. Many branches of work are included in electrical engineering in any of which there is always to be found a generous income for the capable man. Among the best-known lines of electrical work are telegraphy, telephony, illuminating and the construction of motors for supplying electric power. The electrical training in the universities is made as practical as possible and both professors and students keep closely in touch with the commercial and industrial developments in electrical needs. One of the professors of electrical engineering from Cornell university worked last summer as an electrical inspector for the New York, New Haven & Hartford Railroad company in order to study the needs in this branch of the work. Another professor in a western university, assisted by several students, installed an electric light plant in a nearby town.—Missoulian, April 23, 1912.



VIEW IN MACHINE SHOPS.

NEW YELL LEADERS.

At Singing on the Steps Monday evening R. Justin Miller and H. F. Sewell, the debaters who won an unanimous decision over Washington State College, told of their victory and the magnanimous treatment accorded them by the Pullman men.

Lucius Forbes and LaRue Smith tried out as assistant yell leaders. An assistant to Yell Leader Vealy will be elected at Singing on the Steps tonight. This man will help Vealy during Interscholastic week.

ON SANITATION.

Those of our readers who are interested in the sanitation of the home will do well to read the continued article on "The Art of Vacuum Cleaning."—Heating and Ventilation Magazine, March, 1912.

A SAVER.

"Every little bit added to what you've got, makes just a little bit more." The Engineer is in the business of saving money for the people.

NAVAL WIRELESS TELEPHONY ON THE PACIFIC COAST.

We are unofficially informed that having demonstrated that it is possible to talk by wireless telephone from Mare Island to Point Loma, California, a distance of 450 miles, the Navy Department has accepted the installations of the National Wireless Telegraph and Telephone Company at Mare Island, Goat Island and Fariallone Islands and two cruisers.

LARGEST TURBINE.

The Commonwealth Edison Company of Chicago have ordered a 30,000 KW. steam turbine from C. A. Parsons & Co. The turbine is guaranteed to produce a KW. Hr. on 11½ pounds of steam with an initial pressure of 200 pounds, and 200 degrees superheat and a vacuum of 29 inches.